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Alinco DJ-X2T*

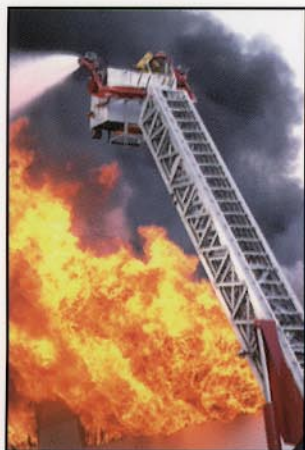
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DX Guide to South America on Shortwave

Volume 19, No. 12
December 2000



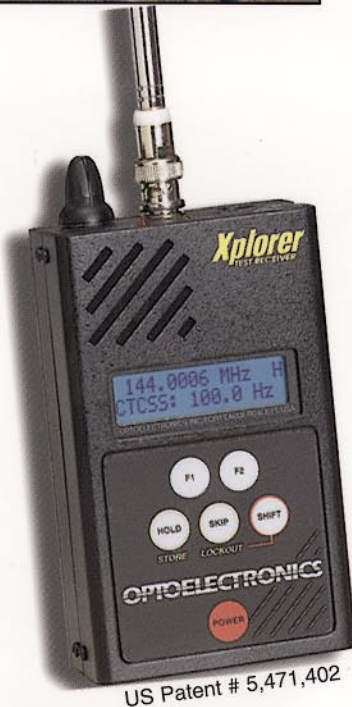
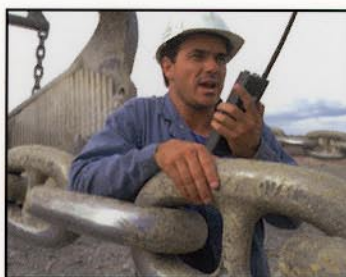
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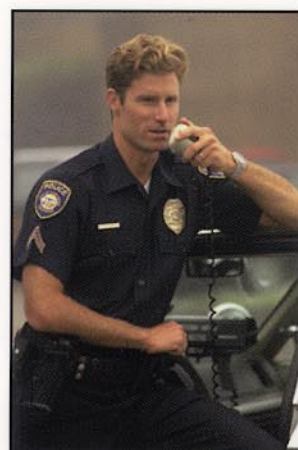
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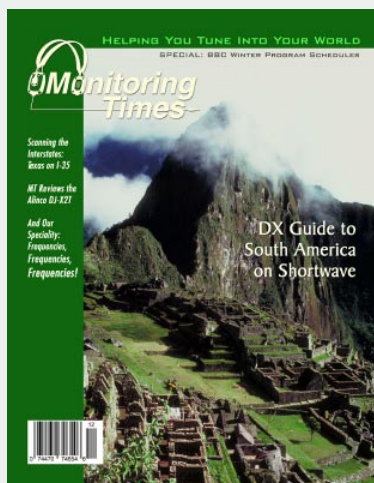
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Vol. 19, No. 12 December 2000



Cover Story

Listening in on South America

By Dave White

The huge continent of South America is a surprisingly difficult shortwave target for a number of reasons. Many countries have no external shortwave service, and many have very few domestic shortwave broadcasters. English broadcasts are almost nonexistent. On the other hand, fascinating Latin rhythms and local color make South America a DX challenge that can turn into a life-long fascination.

Dave White kicks off this comprehensive DX guide with a country by country description of who's on where and what you can expect to hear, starting on page 10.

Guide to QSL Addresses: South America 16

By Gayle Van Horn

Hang on to this article! Four jam-packed pages list South American station addresses accumulated over the years by *MT*'s "QSL Report" editor. But first, she has some advice on politely requesting a QSL from these poor but proud neighbors to the south.

San Francisco's Radio Heritage 22

By Leon Fletcher

Historians may disagree about the first radio station to broadcast regularly scheduled programs, but a very strong case can be made on behalf of a station in San Francisco with a unique story. In fact, two San Francisco stations claim to precede Pittsburgh's KDKA. Many well-known actors and writers got their start in this radio-rich town.

Roadtrip! Scanning I-35 26

By John Mayson

Most of us love to travel, but these days we're usually doing it along the nation's superhighways. Packing the scanner is often just wishful thinking as the counties whiz by faster than our search functions. Here's a new approach to try – be prepared with basic frequencies and bandplans for public safety communications geared to your route. As an example, let's travel the Texas portion of the NAFTA Highway, Interstate-35.



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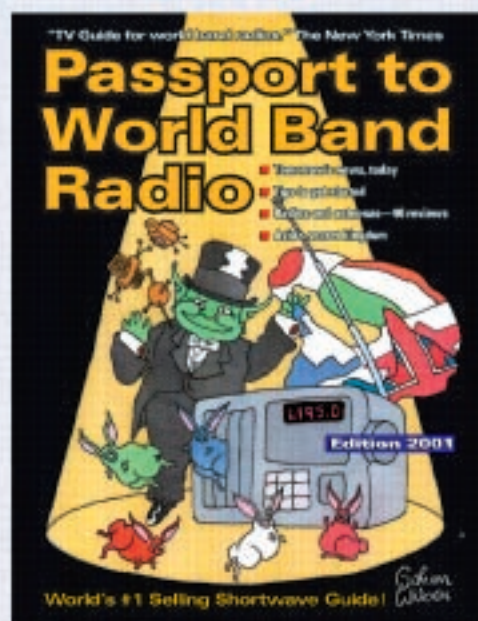
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MONITORING TIMES
(ISSN: 0889-5341;
Publishers Mail
Agreement #1253492)
is published monthly by
Grove Enterprises, Inc.,
Brasstown, North
Carolina, USA.

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Address: P.O. Box 98,
7540 Highway 64 West,
Brasstown, NC 28902-0098
Telephone: (828) 837-9200
Fax: (828) 837-2216 (24
hours)

Internet Address: www.grove-ent.com or
e-mail: mt@grove-ent.com

Editorial e-mail: mteditor@grove-ent.com
Subscriptions: order@grove-ent.com

Subscription Rates: \$25.95 in US; \$38.50
Canada; and \$57.50 foreign elsewhere, US
funds. Label indicates last issue of subscrip-
tion. See page 106 for subscription
information.

Postmaster:
Send address changes to *Monitoring Times*,
P.O. Box 98, Brasstown, NC 28902-0098.

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Reviews:

A lot of interest has preceded the release of Alinco's DJ-X2T wide coverage handheld receiver. Its innovative design and diminutive size make comparisons to the Icom IC-R2 and Yaesu VR-500 inevitable. See Parnass' review on page 100.

A major drawback of oldie-but-goodies like the Icom IC-R7000 is their slow scan speed. Catalano uses four software programs to bypass the outdated electronics of the R7000 to improve its performance (p.96).

So many useful functions are packed into the hand-held Protek 3201 RF field analyzer – spectrum analyzer, frequency counter, data recorder and more – that the only thing that may keep it from the hobby market is its price (p.102).

Whether you're buying a short-wave receiver or a scanner, selectivity is a major consideration in evaluating its performance. To understand this important parameter, turn to Ian Poole's article on page 98.

TABLE OF CONTENTS

Washington Whispers	4
<i>Monitoring Raises Privacy Questions</i>	
Letters	6
Communications	8
Stock Exchange	106
Advertisers Index	106
Department Staff	106
Closing Comments	108
<i>Holiday Greetings from the staff!</i>	

First Departments

Getting Started	
Glossary	28
Beginners Corner	30
<i>10 Meters Makes Commuting Fun</i>	
Ask Bob	32
Bright Ideas	33
Scanning Report	34
<i>Sunshine State not so Sunny</i>	
Utility World	38
<i>The Guide to MUF Surfing</i>	
Utility Logs	39
Digital Digest	41
<i>Where to listen, what to log</i>	
Global Forum	42
<i>Silent Countries Now Webcasting</i>	
Broadcast Logs	45
The QSL Report	46
<i>S American website directory</i>	

Listening Guide

English Language SW Guide	48
Propagation Conditions	68
Programming Spotlight	69
<i>Half Full or Half Empty?</i>	
Satellite Radio Guide	70
<i>SCPC Guide</i>	
<i>Loading Report: Morelos 2, Galaxy 5</i>	

Second Departments

The Launching Pad	72
<i>4DTV Saves the Day</i>	
View from Above	74
<i>Performance Anxiety</i>	
The Fed Files	76
<i>Federal Freqs in Alaska</i>	
Tracking the Trunks	78
<i>Who's on Where?</i>	
Service Search	80
<i>Highway Maintenance</i>	
Plane Talk	81
<i>Bound for the Northwest</i>	
American Bandscan	82
<i>New AM Stations?</i>	
Outer Limits	83
<i>Best SW Site: Clandestine Radio</i>	
Below 500 kHz	84
<i>The Prime Season</i>	
On the Ham Bands	85
<i>All I Want for Christmas</i>	
Antenna Topics	90
<i>Noise: The Arch-Enemy</i>	
Radio Restorations	92
<i>Digging into the Transitone</i>	
Project Pages	94
<i>Taming Your Outside Antenna</i>	

MT Reviews

Computers & Radio	96
<i>Teaching an Old Dog New Tricks</i>	
Shortwave Equipment	98
<i>What is receiver selectivity?</i>	
Scanner Equipment	100
<i>Alinco DJ-X2T Wideband Receiver</i>	
MT Review	102
<i>Protek 3201 RF Field Analyzer</i>	
What's New	104



High Tech Monitoring Raises Privacy Questions

STOA stands for the “Scientific and Technological Options Assessment” agency. Established in 1987 and headquartered in Luxembourg, it is an official and little known technology research agency of the European Parliament.

The STOA Panel is charged with scrutinizing the impact of science and technology on various social, political, environmental and economic issues.

A recent study published by STOA, entitled “Interception Capabilities 2000,” is a brutally frank and in depth study of how various nations of the world obtain information about what governments, organizations and maybe private citizens are doing.

“Interception Capabilities 2000”

Communications intelligence (Comint) is information derived from foreign communications by other than the intended recipient – covert surveillance or spying. The report says that Comint has become a large-scale industrial activity employing many workers who sift through high capacity civil telecommunications systems using high degrees of automation.

The traditional targets have been military messages and diplomatic communications between foreign countries. Also targeted, following the growth of world trade, is economic intelligence about technical and scientific developments. More recent targets include narcotics trafficking, money laundering, terrorism and organized crime.

The UKUSA agreement

The United States Sigint (Signal Intelligence) unit consists of the NSA (National Security Agency), the Central Security Service (military support units) and parts of the CIA (Central Intelligence Agency.) Following wartime collaboration, the UK and the US made a secret agreement in 1947 to continue to conduct collaborative global Comint activities. Canada, Australia and New Zealand later joined the UKUSA alliance.

Besides UKUSA, there are at least 30 other nations intercepting sensitive information. The largest is the Russian FAPSI with 54,000 employees. China has a “substantial” Sigint system, two stations of which are directed at Russia and operate in collaboration with the United States. Most Middle Eastern and Asian nations – in particular Israel, India and Pakistan – have large communications intelligence agencies.

Collection, processing, production and dissemination

Communications intelligence collection includes acquiring the intercepted information and passing the data downstream to human analysts for processing and production. Processing is the conversion of the collected information into a form suitable for analysis. Production involves the evaluation and interpretation of raw intercepted data into finished intelligence. Dissemination is the passing of the de-

crypted or translated intelligence to the appropriate party.

Once targets have been selected, the collection process is determined based on the type of information required, the susceptibility of the targeted activity to collection and the likelihood of collection. This task was simple years ago when refracted long range (HF) radio communications were easily intercepted. From 1940 to 1980, both NSA and the GCHQ (Government Communications Headquarters, its British counterpart) operated HF radio interception.

Today’s modern communications systems, however, require unusual, expensive or intrusive methods to gain access. For example, intercity microwave radio-relay systems, international satellite links and fiber optic subsea cables carry mixed television, telephone, fax, data links, private voice and data. They are all monitored.

Intelligence data including telemetry, VHF/UHF radio, cellular mobile phones, paging signals, mobile data and microwave radio are collected by Comint satellites which cost around \$1 billion each. “...the United States can if it chooses, direct space collection systems to intercept mobile communications signals and microwave city-to-city traffic, anywhere on the planet.” While no other nation has the sophisticated satellite intelligence collection capability of the United States, some other nations do have Comint satellites. For example, Russia’s FAPSI operates a large ground collection site in Cuba and Vietnam.

Communications from undersea cables can be “tapped” by wrapping coils around the cable using remotely controlled drones. “The United States is the only naval power known to have deployed deep-sea technology for this purpose.” Optical fiber cables do not leak RF signals and cannot be tapped using inductive loops. “NSA and other Comint agencies have spent a great deal of money on research into tapping optical fibers, reportedly with little success.”

Intercepting the Internet

Most of the world’s Internet capacity lies within or connects to the United States. Thus a large proportion of international Internet communications is readily accessible to NSA. Internet packets are inherently easy to identify as to sender, recipient and country. But, “Unless special warrants are issued, NSA is normally legally restricted to looking only at communications that start or finish in a foreign country.”

NSA employs “bots” (robots) to collect non-verbal data of interest. This global surveillance system run by the military-intelligence community is code-named ECHELON. The system attempts to capture staggering volumes of satellite, microwave, private phone calls, Internet, cellular, fax, telex and fiber-optic traffic, including communications to and from North America. This data is then filtered for code words or phrases.

New evidence shows that this computer “sifting” of intercepted communications has existed for more than 20 years.

The key component of the system are “dictionary” computers which pick out key words and hunt out hundreds of individuals and corporations.

The presence of “dictionary” computers has been confirmed in Canada, Australia, New Zealand and England. The U.S. operates ECHELON sites at Sugar Grove, WV, and at Sabana Seca, Puerto Rico.

The intelligence community is very concerned about the difficulty of future information gathering. The shift in telecommunications to high capacity optical fiber networks requires access to the cables for interception. And the war against readable commercially-available cryptography appears lost. [Published by the European Parliament Directorate General for Research, Luxembourg.]

The release of the STOA report sparked a firestorm of controversy in Europe! The European Parliament said it believed the American-led ECHELON posed a threat to privacy and civil liberties. It further believes the need to protect national security is not ECHELON’s only concern and that industrial espionage has become a part of ECHELON’s activities.

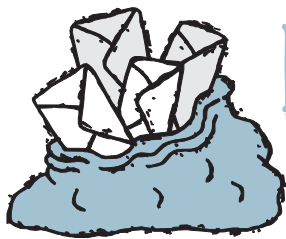
The French government has launched an official investigation into the possibility that information has been given to American companies in an attempt to gain an advantage over rival firms. And both the Italian and Danish governments have begun separate investigations of Echelon’s intelligence-gathering efforts.

There is no question that ECHELON is a formidable means for fighting corruption, organized crime and terrorism, although the United States government refuses to admit that ECHELON even exists. The FBI has reluctantly admitted, however, that they do use another digital snoop tool (code named CARNIVORE). This Internet surveillance program is somewhat similar to ECHELON. The FBI insists its “Carnivore” e-mail surveillance system is used only with a court order.

Wiretapping under Title 18 of the criminal code can only be accomplished under court order. Automatic electronic snooping may involve the interception of communications involving Americans in the United States without a court order. Civil libertarians want to be certain that the ECHELON and CARNIVORE systems do not filter, monitor and capture the private mail of innocent users. The American Civil Liberties Union has already asked Congress to hold a hearing on ECHELON.

These massive surveillance systems operate with little oversight and members of the *House Select Committee on Intelligence* want to know if the communications of Americans were being intercepted and under what authority.

The ACLU has constructed a website called “Echelon Watch” dedicated to keeping tabs on the surveillance technique at <http://www.aclu.org/echelonwatch/>



LETTERS TO THE EDITOR

Smart choices

"The new low-resolution magazine loads about 1 hour and 10 minutes at 46.6 on a 56k modem and I am still impressed! I always felt self conscious about all that paper coming out to my home in the mail and the devastation of Canada's forests, because America cannot get a grip on its self indulgent ways. Thanks, I am glad I upgraded to downloading your magazine!"

— **Mark Swarbrick, Newtown Square, PA**

Mark is referring to the fact that MT Express subscribers have the option of downloading a high-resolution version of the magazine, or a faster-loading, lower-resolution version.

"Scouting" out antennas

"I recently picked up an Opto Scout along with the 'micro' antenna they suggest. I've used this equipment before and am generally familiar with its operation. Now that I own one I've become more critical of its operation and have made the following observations.

"The micro antenna they supply obviously has a very small capture area and tends to keep the signals it receives to those nearby. Understanding how the Scout operates, I see this as an advantage. I noticed that the operation is especially good in the 800 - 950 MHz region, decreasing the farther you go from these frequencies. In the 30-50 MHz area it's basically deaf.

"I decided to do some testing and discovered that the antenna is resonant at about 918 MHz. Received signal strength also peaks in this part of the spectrum. Based on the concept of a

'nearfield' receiving antenna, I'm wondering if the small rubber antennas that NASCAR listeners use might be better suited for VHF (150-170) / UHF (400-500) use. Or, have you any other suggestions? I'm thinking that FM broadcast stations might offer some desensing, so I may try inserting a FM trap in line with the antenna."

— **Bob Kozlarek, Elmwood Park, NJ**

I fielded this question to Bob Grove, who responded, "You're right on all counts. Intuitively, I think you've answered your own questions.

"By keeping the general RF field density low, the counter responds only to near field signals which it interprets as being the strongest, so you don't get false products. But by substituting a resonant 155 MHz rubber duckie, you'd encourage the detection of nearby 152/158 MHz pager signals, NOAA weather broadcasters, and other powerhouses that could give false readings in a near-field environment. An FM trap will certainly reduce those broadcasters by 30 dB or so."

Nextel news

"I was reading my e-copy of November's MT and saw the question about Nextel radios (in "Ask Bob," in which the writer noted Nextel was used because it could be used as a walkie-talkie). We use Nextel extensively at work and I have spoken to one of their engineers about the service.

"Nextel primarily uses three models of radios/phones, all made by Motorola – the i500, i700, and i1000. These are Motorola iDEN radios/phones. Each unit can be configured as a cell phone only, a two-way radio only, or both. They also have alpha paging and Internet capabilities.

"I did not get a clear answer out of the engineer as to which frequencies these units use; however, playing around with the diagnostics mode, I did find an option which displayed the frequency being used. I have determined that both telephone and radio transmissions occur in the

(approx) 850 - 868 MHz region, which is definitely noncellular.

"However my Trunk Tracker could not even follow these transmissions. iDEN is a proprietary modulation scheme and it's highly unlikely there will ever be an off-the-shelf scanner capable of receiving these. I did hear of a person in the Atlanta area who used Motorola test equipment to listen to the Georgia State Patrol iDEN radios provided by SouthLinc, but I don't know the details. Since then, the GSP has dropped these radios and gone back to their VHF system.

"The range really depends on the service area. We're in the Texas/Oklahoma service area which covers mostly along Interstate corridors from San Antonio and Houston, up to the Dallas area, and up into Oklahoma City and Tulsa. Outside of this area they're useless as a two-way radio. Like most digital communications, they're either very clear and crisp, or totally inaudible."

— **John Mayson**

Dan Veeneman adds, "Nextel uses frequencies in the SMR band between cellular mobile transmit and cellular base transmit."

Huh?

Ken Hydeman says he lost his original notes on this unusual traffic, and wonders if anyone else heard these communications?

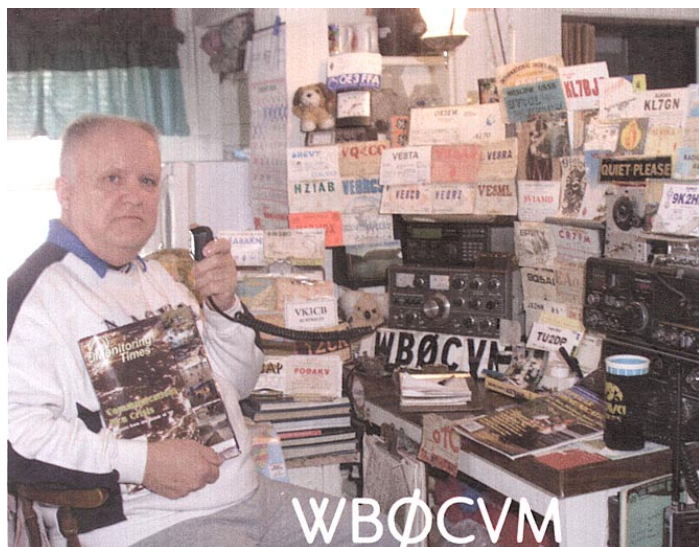
"I think it was on the night of June 13, I was doing some shortwave listening. On 7115 kHz I heard an interesting communication between W1VOA and other stations, W1VOA's location being Greenville, NC. I got the impression they were using VOA antennas. The VOA operator said a local university hospital wanted to be able to contact a hospital in Hawaii which they did earlier – It sounded like they wanted a path of communication for both routine and emergency situations. All transmissions ended at midnight local time."

— **Ken Hydeman, Xenia, OH**

A callsign lookup and then a visit to the ARRL website brought the answer to your question, Ken, and it's rather interesting. Following is an excerpt of the preliminary press release from the Brightleaf Amateur Radio Club of Pitt County, NC.

"The Amateur Radio Emergency Service (ARES) (see: <http://www.ncarrl.org/ares/>) and Brightleaf Amateur Radio Club of Pitt County (see: <http://www.qsl.net/w4amc/>) are working to support RIMPAC

2000/Operation Strong Angel organized by the United States Navy Third Fleet. This exercise,



Monitoring Times is on the cover of Dave Lund's QSL card (operating daily on 20 meters SSB).

which will be conducted in Hawaii June 10-16, 2000, is a US Navy Exercise designed as a mock disaster drill. Operation Strong Angel formally involves the telemedicine arm of the Brody School of Medicine to provide medical support for this eight nation effort (see:

<http://www.telemmed.med.ecu.edu/strong/index.htm>).

"Pitt County ARES hams will provide initial connectivity between Brody School of Medicine and the Strong Angel Base I utilizing the mammoth antennas of the recently decommissioned Voice of America, Site C - Edward R. Murrow Memorial Greenville Relay Station. This unique site is in transition between the U. S. Government and ECU (East Carolina University).

"The antennas were designed to provide extremely sensitive reception directed at all parts of the world to assure collection of national news broadcasts that were in turn assembled for broadcast at studios in Washington, DC, at the VOA transmitter sites in Pitt County, and other parts of the US). Imagine more than 85 towers carrying miles of wire designed solely for radio reception - a ham radio operator's heaven! Our operators are not merely listening. These antennas also facilitate low power transmissions characteristic of amateur radio - 100 watts - a mere candle flicker in comparison with the multiple transmitters of USIA's VOA Sites A and B in

other parts of Pitt County transmitting half a million watts apiece!

"The Brightleaf Amateur Radio Club was recently assigned a second club callsign - W1VOA. This callsign is being used at Site C during this exercise. Voice communications are scheduled to be initiated between Site C and the Puu Paa, Hawaii, site of Operation Strong Angel beginning Saturday evening, June 10.

"Future exercises are already in planning stages that will target the Central American nation of El Salvador next spring. Pending successful amateur radio operations from VOA Site C to Strong Angel arguments will be strengthened for retaining some of these invaluable antenna structures - far beyond the economic resources of our amateur radio community - to provide an ongoing international telemedicine communications resource. Further benefits would possibly include meeting, training, and disaster communications center with modest space requirements."

A Fond Farewell and A Merry Millennium!

This month marks the final "Propagation Conditions" column by Jacques d'Avignon, who's been preparing the charts for *Monitoring Times* since February 1992. We have valued Jacques' dedication to the hobby and to *MT*, not only through his column, but in his feature ar-

ticles on propagation, Radio France antennas, DXpeditions, product reviews, and as a speaker on propagation theory at nearly every *Monitoring Times* convention.

Information on propagation conditions is widely available from a number of sources, or using software. Jacques is a distributor for one such program, and will also do custom charts for anyone needing this service. Please see his ad on page 61. Meanwhile we'll ask Jacques to continue exploring the mystery of propagation for *MT* readers in periodic feature articles.

On another matter, we're delighted to report that the plastic magazine covers have been enormously successful in cutting down on loss and damage. Many of you who never asked for replacement magazine have also expressed your appreciation for the good condition in which *MT* has arrived. So, at this yuletide season our gift to you is to continue the plastic covers for the foreseeable future.

Thank you all for your support through the years. You've been generous with your sharing of information, your financial support, and your praise! *MT* wouldn't be here without the first two, and the praise makes our rewarding work even more so. Here's to many more years of merry monitoring times together in the new millennium!

— Rachel Baughn, Editor

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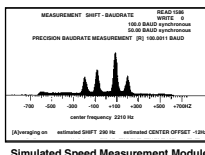
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Radio Honor Roll

Amateur radio to the rescue

This past August, Larry Boston, 67, was fulfilling his dream of sailing solo from San Francisco to Hilo, Hawaii, in his 30-foot sailboat, but his plans went awry when a large wave hit the boat. Boston was slammed against the chart table, breaking four ribs. Boston activated his 406 MHz emergency beacon (EPIRB) which was picked up by the Search and Rescue satellite (SARSAT). The Coast Guard confirmed his location with Boston's wife and contacted a cargo ship in the area that was able to find and pick him up.

The first action he took, however, was to get on the radio where he found a ham who promised to contact the Coast Guard. "I am thankful to the amateur radio community who came through, as they always do," said Larry Boston.

Little Hero Award

The Pacific NorthWest REACT Council presented 11 year old Mikayla Whitley of Marysville, Washington, with a "Little Hero" Award and the REACT International "Distinguished Service" Award. REACT (Radio Emergency Associated Communications Teams) honored Mikayla for her quick actions and devoted efforts to get help by relaying information and directions to rescue workers who were trying to get to a injured hiker Michael Wyant who fell on the west ridge of Mt. Stuart in Chelan County. Assuming this story is true, that is a reception distance of 100 miles from an FRS radio with a two-mile reception limit and 532 different channel combinations!

UK Shortwaves still restricted

After a 16 year battle, the European Court of Human Rights has ruled that the UK government cannot be compelled to allow independent stations on shortwave because it did permit independent operators on the medium wave and FM bands. Under human rights law, the government can continue with its restrictive policy of refusing to allow independent stations on SW, but this now raises the separate question of whether the SW monopoly is legal under European Union competition law.

In 1984, Trevor Brook devised the concept of an independent science, technology and media news shortwave radio station, Radiofax. He made his first written application to the government for a license in August 1986. The government, however, persistently claimed there was a lack of spare capacity on the 993 shortwave channels and refused to issue any such license. This led him, in August 1997, to take the issue to the European Court of Human Rights in Strasbourg. In Trevor Brook's case before the

court he asserted that the government had used an untrue premise in order to operate a covert policy of restricting media access, to the detriment of the public and in breach of Article 10 of the European Convention on Human Rights... (*Surrey Electronics via British DX Club, gh*)

Vatican Radio goes to court

Three executives at Vatican Radio will be tried in Rome over its allegedly harmful electromagnetic pollution. The decision follows a magistrates' inquiry after the Vatican said that it was not answerable to Italian law. Assisted by lawyers, including Eugenio Pacelli, a nephew of Pope Pius XII, the Vatican said that there was no proof.

The inquiry began after it was shown that in a three mile radius of the station's antennae at Santa Maria di Galeria, Rome, the percentage of tumors and leukemia among the 30,000 inhabitants was well above average. Two Jesuits, Father Pasquale Borgomeo, the radio's director general, and Father Roberto Tucci, its president, with Constantino Pacifici, technical director, will be charged with "dangerous throwing of things" in the absence of a law on electromagnetic radiation (*Daily Telegraph via Mike Barraclough, gh*)

Motorola system to be dismantled

The state of Florida has decided to "privatize" the statewide police radio system it has been attempting to construct for more than 10 years and which is only 40 percent complete. In a surprise move, a plan to split the remaining work between Motorola and rival Com-Net Ericsson was scrapped in favor of awarding the entire contract to Ericsson.

The system has cost the state \$113 million. Splitting the work was estimated at \$700 million. The new contract pays Ericsson \$271 million dollars and runs for 20 years. Motorola is contesting the decision, questioning the bidding procedure, and trying to tie the case up in court.

Among Motorola's contentions is that the Ericsson radios will not be compliant with the APCO 25 standard. The need for interagency compatibility was high on the state's list following the Hurricane Georges and wildfire disasters.

Other communications system news

In Honolulu, HI, the police officers' union began an ad campaign to protest "dead spots" and unsafe conditions of the two-year-old Ericsson 800 MHz system. Designed for digital trunking, the system resorted to analog operation after 6 months.

Chester County, PA, police chiefs stated the county's E.F. Johnson system is a threat to officer and public safety and recommended agencies that still had the equipment return to the 150 MHz system and use the digital system only

as a back-up. Interference from cellular sites is given as one cause for the problems.

Orange County, CA, brought on some of its own problems when its 1994 bankruptcy forced the county to purchase an emergency system which couldn't guarantee reception inside buildings – not even inside the Irvine and Tustin police headquarters. Motorola has received praise by fire officials for effective follow-up to reported problems.

More scanners seized by customs

In another Legal Notice published by *The New York Times*, five persons were listed as having scanners or wide range receivers seized at the Chicago Customs Office in 1998 and 1999 for failure to meet the Wire Interception and Interception of Oral Communications Statute – these units included prohibited cellular reception.

Harassment by remote control

A retired couple in a wooded suburb of Detroit returned from vacation last summer to discover someone had disabled their security system. Then threatening notes and racial slurs began to appear on their television screen. The perpetrator used names of family members, pets, and neighbors. Channels changed at random



December 2: NWS Special Event

A National Weather Service Special Event (NWSSE) cosponsored with the ARRL will take place at National Weather Service offices across the country from 0000Z to 2400Z December 2nd, 2000 (24 Hours from Friday evening through Saturday). Modes utilized: Phone, RTTY, APRS, Satellite, CW, PSK-31 on 2, 6, 10, 15, 20, 40, 80 meters and 70 centimeters. Log all NWSSE contacts during event. No points, but special QSL Certificates will be obtainable. Please check <http://www.nws.noaa.gov/event2000> for more details.

Dec 9-10: 28 MHz SWL Contest 2000

A DX challenge issued by French DXer Franck Parisot to listen to the most countries, US states and Canadian provinces on 10 meters. Contest open to all SWLs worldwide. 0000 UTC Dec 9 to 2359 UTC Dec 10 during the ARRL 10 meter contest. Prizes awarded by sponsors Grundig and Klingenfuss Publications. For rules and information email franckparisot@minitel.net or write F-124368, Franck Parisot, BP 6, 92173 Vanves Cedex, France

Dec 16: Special Event

S Maryland ARC and Charles County ARC will operate on Cobb Island, MD, to commemorate 100th anniversary of the first radio voice transmission by Aubrey Fessenden and Frank Very. QSL cards to SWLs as well as ham contacts. Visit <http://www.qsl.net/smarc> or write SMARC, PO Box 273, Cheltenham, MD 20623 or email Frank Carson N3OCW <fcarsen@ios.com> for details.

or the TV came on at top volume during the night. The messages were typed on a keyboard used to select movies from the couple's DirecTV satellite system. During the Labor Day weekend the family taped more than 10 messages.

The local police turned the case over to the FBI. The FBI considers it a civil rights violation. The Smiths are black; one neighbor who was also threatened in the messages is a Mexican American.

Officials suspect someone is using a radio-frequency remote control to type the messages. A remote control could be used outside the house to enter words and change channels and volume levels on the Smith's televisions, said a DirecTV spokesman.

Voice of Palestine under fire

In retaliatory attacks on Palestinian government buildings in October, one of the first targets for Israeli rockets was the Voice of Palestine radio and television headquarters. As far as Israel is concerned, radio is a weapon which may have led to the lynching of three Israeli soldiers in Ramallah.

Radwan Abu Ayyash, chairman of the Palestinian Broadcasting Corp, says when he shows scenes of confrontation he just reports the news. "Look, when there's peace I'll broadcast that. But when they make war on us, that's what will be on the air. I'm not inventing all this."

Voice of Palestine programming was back on the air within hours, carried by private FM stations across the West Bank.

Cut out the turf battles, says Clinton

In an executive order, President Clinton told the Pentagon, Commerce Department, FCC and other agencies to work more cooperatively to free up spectrum space for sale to private companies for advanced wireless phones and mobile accessories. Most hotly contested are frequencies in the 1755-1850 MHz band, currently allocated for Air Force communications, intelligence gathering, and the GPS system.

No cellular tracking without court order

A Federal Court of Appeals has ruled that the government may not require cellular carriers to provide them with information that is "not authorized to be intercepted," and that such authorization must be "something more than a pen register order" which does not require proof of probable cause unlike a wiretap order. The ruling may also call into question the legality of Carnivore which scans the internet for target words or people. (See this month's *Washington Whispers* for more on Carnivore.)

Hispanic Pirate Gets Creative

La Nueva Radio Musical broadcast to the

New Haven, CT, Hispanic community for two years on 104.5 FM without a license, but was finally forced off the air by court order last April. Now they're back and they're legal!

In a deal worked out with Cox Radio, La Nueva is using WPLR's 92 kHz subcarrier. The signal, often used by reading services for the sight impaired, requires a special radio with a secondary audio channel. About 500 radios have already been sold to area residents by local Hispanic-owned stores.

In Memory of Gigi Lytle

The short, feisty redhead stood out at *Monitoring Times* conventions where females were already small in number; Gigi Lytle's name should also be familiar to anyone in shortwave DX circles. *Monitoring Times* regrets to report that Gigi (Gloria Gay) died of cancer at the age of 57 on Oct. 17, 2000, at her home in Lubbock, Texas.

Gigi was a legal secretary, past volunteer for Civil Air Patrol and Girl Scouts, and an active member of the worldwide shortwave radio community. She won a trip to China in 1993 in a world radio contest.

Surviving are a son, two daughters, her mother, a brother, and her companion Tom McLaughlin. Upon hearing of her unexpected death, Skip Arey wrote, "In all my years in this hobby I have rarely met anyone as dedicated to shortwave monitoring."



Gigi with friends (from left); Gigi, Marie Lamb, Ed Newbury, Mike Schulsinger and Maryanne Kehoe

Communications is compiled by Rachel Baughn, Editor, from news and clippings from our readers. Thanks to this month's reporters: Anonymous - Orlando FL, Albany NY, Autin TX; Glenn Diggs, Merritt Is, FL; Ken Hydeman, Xenia, OH; Kevin Klein, Neenah, WI; James Kopf, Ann Arbor, MI; Sterling Marcher, La Mirada, CA; Ed Michelman, Honolulu, HI; Bob Mills, San Diego, CA; John Reilly, Shelton, CT; Doug Robertson, Oxnard, CA; Brian Rogers, Melvindale, MI; Richard Schultz, Louisville, KY; Sedláček, Omaha, NE; Jay Steimel, Lincoln, AR; Robert Thomas, Bridgeport, CT; Joseph Thornton, Fort Myers, FL. Via email: Mark Bajec, Jim Blaine, Brian Cathcart, Charles Crawford, Bill Crocker, Robert Cummings, Cheryl Dragel, Robert Felton, Mike Kowall, Ryan North, Peter Szerlag, Larry Van Horn, Peter Vieth, Robert Wyman, and Surrey Electronics

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Listening in on South America

By Dave White



The Carnival in Rio ... The Amazon jungle ... Challenging and interesting shortwave listening. Many readers might respond with the first two of these three when asked, "What comes to mind when you think of South America?" However, in spite of the fact that this large piece of real estate stretches from north of the equator to the icy waters of the Antarctic, South America is not often cited when the question is, "Where are your favorite DX targets?"

Although more stable and less volatile than developing countries in Africa, South American governments and residents are focused far more on internal problems than on broadcasting to the world. Virtually every country on the continent has some connection to illegal drugs, be it growing them, processing them, or transporting them. Economic and political uncertainty abound.

While you won't find much in the way of English language broadcasts, or external shortwave services in any language, South America does offer a wealth of interesting shortwave listening possibilities, with signals from the tropical bands all the way up to 11 meters. Even when you don't understand the language, there's nothing quite like hearing the fevered excitement of a soccer match, the sassy beat of tango music, or the exuberance of a local morning DJ in a village in the Andes.

Listening Tips

We all know that there are no absolutes in life other than death, taxes, and the certainty that there will be a static crash or deep fade just as a rare station gives an ID. You can be reasonably assured, however, that you won't have a wide

variety of languages to translate. With very few exceptions – Portuguese in Brazil, Dutch in Suriname, French in Guiana, English in Guyana – the predominant language throughout the continent is Spanish. Occasionally, you will hear some native dialects, but they tend to borrow heavily from the Spanish language and thus sound somewhat like it.

Time zones range from UTC-2 in eastern Brazil to UTC-5 in Colombia and Peru. Daylight Saving Time is observed between October and February in Chile, Paraguay and parts of Brazil, but that isn't a major factor since we're listening for stations, rather than scheduled programs. Of greater importance are your local sunrise and sunset times, and those at the target station.

For stations in the tropical bands below 6 MHz, the best times to listen are when both you and the station are in darkness. In practice, your best times to catch those stations will be from a few minutes before your local sunset until just after your local sunrise. Stations above 11 MHz can often be heard during your local daylight hours in the fall and winter.

Unless you speak the language, recording what you hear can be extremely useful in making a positive ID. It sometimes takes repeated listening to decipher the name of a town or station. Broadcasters in different South American countries often use the same frequencies, so *World Radio TV Handbook* and/or *Passport To World Band Radio* are very helpful in identifying what country you're hearing. For current information on stations that are being logged, monthly *MT Global Forum* columns by Glenn Hauser and Gayle Van Horn are invaluable.

Domestic stations tend not to worry too much about technical standards, including modulation level and operating frequency. It is almost certain that most stations will be operating somewhere near, though not precisely on, their published frequencies. Their audio levels can be so low that you can only detect a carrier, or so high that you can only hear distortion. Stations are also prone to starting up, shutting down, or moving to another town, all with little or no warning.

With all of this in mind, along with the standard conventions – times are UTC, frequencies are in kHz – let's listen in!

ARGENTINA

While other large South American countries boast dozens of shortwave stations, Argentina's can be counted on the fingers of one hand. Roughly 500 AM and FM stations serve local and regional areas, and what little shortwave activity that exists is limited primarily to the country's external service and simulcasts of various AM and FM stations directed to nearby Antarctica.

Radiodifusión Argentina Al Exterior (RAE) is the country's easiest SW catch. RAE broad-



Radio EL MUNDO
Buenos Aires - Argentina

1070 KHZ **100 KW**

FM	B1.3	MHz	19-mts.
LRU	15,290	KHz	20 mts.
LAX	11,755	KHz	49 mts.
LAX1	8,120	KHz	31 mts.
LAX2	9,710	KHz	

casts two hours of English each day, beamed to North America on 11710 from 0200-0300 and to Europe and Africa on 15345 from 1800-1900. In addition to those frequencies, 9690 is also used for broadcasts in French, German, Italian, Japanese, Portuguese and Spanish. On weekends, RAE carries programming of the Radio Nacional service, which at other times uses published frequencies of 3375, 4955, 5975 and 6060 at various, relatively low, power levels. Advance program information for RAE is virtually unheard of. The station does not currently operate a website, and the information that is released is generally confined to time/frequency/language information.

Other opportunities for Argentine DX offer a chance to sample the local "flavor," since they are simulcasts of Buenos Aires AM and FM stations. 15820 is an excellent frequency to monitor for a variety of stations using your receiver's sideband mode. Various local broadcast stations have been reported on both sidebands, sometimes at the same time. Other such "feeder" frequencies that have been logged recently include 7720, 8098, 13363, and 29810, all sideband.

BOLIVIA

The history of shortwave broadcasting in Bolivia is as wild and wooly as the country's political history. In fact, it was dissident tin miners rebelling against government repression who established some of the country's first shortwave stations. Church-sponsored stations also sprang up, first in opposition to the miners and what was perceived as the Communist threat they represented, later in support of the miners against the harsh military rule under which they lived. For years, on-the-air wars of words raged between and among these stations and the government's Radio Illimani. It was normal for station personnel to fortify their facilities and arm themselves against physical attacks.

Bolivia has no external shortwave service. Of the 75 or so licensed shortwave stations,



Radio Altiplano
LA PAZ, BOLIVIA... 11 de septiembre, 1978
Al Swop, Altiplano, Bolivia

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DESDE LA CUMBRE DEL MUNDO HASTA EL PUNTO PRECISO DE SU DIAL
ALTIPLANO EN SINTONIA 24 HORAS AL DIA

about 50 are currently active, and none broadcast in English. Most of these stations operate at power levels of 1kW or less, making them rare DX catches.

Here's a list of Bolivian stations that have

been logged outside the continent in the recent past:

Nominal	Frequency	Station	City
3310	Radio Mosoj Chaski	Cochabamba	
3392	Radioemisoras Camargo	Camargo	
4472	Radio Movima	Santa Ana	
4552	Radiodifusoras Tropico	Trinidad	
4649	Radio Santa Ana	Santa Ana	
4682	Radio Paititi	Guayaramerin	
4702	Radio Eco	San Borja	
4717	Radio Yura	Yura	
4795	Radio Mallku	Uyuni	
4845	Radio Fides	La Paz	
4855	Radio Centenario	Santa Cruz	
4875	Radio La Cruz del Sur	La Paz	
4926	Radio San Miguel	Riberalta	
4945	Radio Illimani	La Paz	
5927	Radiodifusoras Minería	Oruro	
5952	Radio Pio Doce	Siglo Viente	
6025	Radio Illimani	La Paz	
6055	Radio Juan XXIII	Santa Cruz	
6105	Radio Panamericana	La Paz	
6135	Radio Santa Cruz	Santa Cruz	

BRAZIL

The single greatest influence on shortwave radio in Brazil is the country's sheer physical size. Stated simply, it is immense. It is as large as the continental U.S., the fifth largest country in the world, occupying nearly half of the continent and bordering all but two of South America's other countries. Distances between one point and another even in the same general region of the country make shortwave the most practical, and often the only means of communicating.



Quite unlike other countries in which most tropical band stations transmit with a kilowatt or less, most of Brazil's domestic stations operate at 5-to-10 kw. Another difference is that a number of regional Brazilians use the higher frequency bands (6-26 MHz). On the downside, this pits them against higher-powered international broadcasters on those bands. On the plus side, propagation tends to be better, at more times of day, than on the tropical bands. Couple all of this with the fact that there are something in the

neighborhood of 130 active shortwave stations on the air, and you have a potential radio feast.

It is quite common for two or more Brazilians to operate on the same frequency at the same time. They are far enough apart not to interfere with one another in their intended coverage areas, much like the AM and FM bands, where many stations, sufficiently far apart, can occupy the same frequency. The challenge for the DXer is to be able to copy well enough and long enough to positively ID which of the possible stations is being heard.

Many Brazilian stations operate on more than one frequency. So, you can often verify a station's identity by checking these parallel frequencies to see if the same program is being broadcast.

Radio Nacional do Brasil, the country's external shortwave service, has lately been the subject of in-fighting over which governmental agency should control it. The unfortunate result is that English service to North America and Europe was abruptly halted in the summer of 1999. At one time, five Radiobrás 250 kW transmitters broadcast in several languages and could be heard virtually everywhere in the world. The domestic service in Portuguese is a relatively easy catch via Radio Nacional de Amazônia from Brasília on 11780.

Among the Brazilian stations that have been reported recently outside South America:

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Nominal Frequency	Station	City
2380	Rádio Educadora	Limeira
2460	Rádio Alvorada	Rio Branco
4755	Rádio Educação Rural	Campo Grande
4775	Rádio Liberal	Belém
4785	Rádio Caiari	Porto Velho
4805	R. Difusora da Amazonia	Manaus
4815	Radio Difusora	Londrina
4825	Rádio Canção Nova	Cachoeira Paulista
4825	Rádio Educadora	Bragança
4845	Rádio Cultura	Manaus
4875	R. Difusora Roraima	Boa Vista
4885	Rádio Clube do Pará	Belém
4895	Rádio Campo Grande	Campo Grande
4905	Rádio Anhanguera	Araguaina
4905	Rádio Nova Relógio	Rio de Janeiro
4915	Rádio Anhanguera	Goiânia
4915	Rádio Nacional	Macapá
4955	Rádio Clube	Rondonópolis
4956	Rádio Cultura de Campos	Campos
6040	Rádio Clube Paranaense	Curitiba
6060	Rádio Tupi	Curitiba
6090	Rádio Bandeirantes	São Paulo
6135	Rádio Aparecida	Aparecida
6180	R. Nacional da Amazônia	Brasília
9505	Rádio Record	São Paulo
9515	Rádio Novas de Paz	Curitiba
9530	Rádio Nova Visão	Santa Maria
9565	Rádio Tupi	Curitiba
9585	Rádio Globo	São Paulo
9615	Rádio Cultura	São Paulo
9630	Rádio Aparecida	Aparecida
9645	Rádio Bandeirantes	São Paulo
9665	Rádio Marumby	Florianópolis
9695	Rádio Rio Mar	Manaus
11725	Rádio Novas de Paz	Curitiba
11804	Rádio Globo	Rio de Janeiro
11815	Rádio Brasil Central	Goiânia
11830	Rádio Anhanguera	Goiânia
11925	Rádio Bandeirantes	São Paulo

CHILE

This country is a study in contrasts. There are areas in its northern desert that have never recorded a single drop of rain, while its southern tip, just a few hundred miles from Antarctica, is windy, wet and cold. Its northern and southern borders are nearly 3,000 miles apart, but at its widest point the country is barely over 200 miles wide.

In contrast to other South American countries, Chile's economy includes a manufacturing base, in addition to mining and agriculture. As a result, it is one of the more affluent, urbanized countries on the continent. With most of the population concentrated in metropolitan areas in the central part of the country, most Chileans are well within range of local AM, FM and TV signals.

With no need to reach far-flung residents or throw signals across the towering Andes mountains, government and commercial interests have



little interest in shortwave. With a fairly stable democratic government, there hasn't been much need for clandestine opposition stations either.

Like most of its neighbors, Chile has no external shortwave service. Unfortunately, it has virtually no domestic shortwave broadcasters either.

There is only one powerful shortwave signal coming from Chile, belonging to Radio Voz Cristiana in Santiago. Although primarily targeting Central and South America, its signals are regularly heard throughout most of the world.

Here is the latest schedule for Radio Voz Cristiana:

Times	Freq.
0000 - 1400	15375
0100 - 1300	11690
1100 - 2100	21500
1200 - 2200	9635
1300 - 0100	21550
1400 - 0000	17680
2100 - 1100	11745
2200 - 1200	6070

Reports of Chile's other active domestic shortwave stations are rare. Two of the more powerful, Radio Esperanza in Temuco on 6090, and Radio Santa Maria in Coyhaique on 6030 both operate with only 10kW on frequencies that are populated by high-powered competition from the likes of Caribbean Beacon and Radio Marti during the prime nighttime hours.

COLOMBIA

Drug cartels and guerilla uprisings are the most visible features of the South American country that is located the closest to North America. A U.S. State Department alert warns that there is a greater risk of being kidnapped in Colombia than anywhere else in the world.

Now emerging from an economic recession that resulted in a 20% unemployment rate, Colombians are much more focused on their internal problems than on reaching the rest of the world on shortwave. There is no external shortwave service, and the number of active domes-

tic shortwave stations has steadily declined in the last few years.

Radio Difusora Nacional in Bogotá has been heard recently on 4955, 9635 and 9685 between 2030 and 0200.

Simulcasts of various FM stations have been heard on 4895. Try here starting at 0000.

Caracol Villavicencio on 5955 is logged occasionally around 0930. The city of Villavicencio, in central Colombia, is also represented by La Voz del Llano, on or near its nominal frequency of 6117. Listen between 2100 and 0000.

Clandestine La Voz de la Resistencia has been heard around 1100 on 6261 and around 1300 on 6240. The station is operated by the Revolutionary Armed Forces of Colombia-Peoples Army (FARC-EP).

ECUADOR

One of the smaller South American countries, Ecuador is also one of the most geographically diverse, with jungles, rainforests, volcanic mountain ranges, and about 12-million people all packed into an area about the size of Nevada. A relatively stable and peaceful country, the main source of controversy is a longstanding border dispute with Peru.

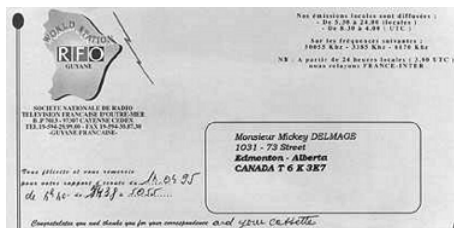
Many DXers (the author included) count "The Voice of the Andes," HCJB, among their first shortwave loggings. With a rich variety of programming, the station remains a favorite among SWLs. One of the most enjoyable ways to learn about the country's cultural diversity is to spend a few hours listening to HCJB's programs about Ecuador. The station can be heard virtually 24 hours a day, virtually anywhere on the globe. Check the *Shortwave Guide* section of *MT* for current schedules and frequencies.

Like its neighbor, Colombia, Ecuador has seen a steep decline in the number of active domestic shortwave stations over the years. Happily, though, a fair number of them operate at comparatively high power (up to 10 kW), and, being located in the northern part of the continent, they are fairly easy to hear in North America.

Nominal Frequency	Station	City
3280	La Voz del Napo	Tena
4780-4802	Radio Oriental	Tena
4919	Radio Quito	Quito
4950	Radio Bahá'í	Otavalo
4960	Radio Federación	Sucúa
5040	La Voz del Upano	Macas
5060	Radio Progreso	Loja
5980	Radio Federación	Sucúa

FRENCH GUIANA

The infamous Devil's Island, now a tourist attraction, was once one of the most notorious



of the French penal colonies that were located here up until the early 1950s. The penal colonies have been replaced with the European Space Agency's launch facilities, and shortwave transmitters used to relay programs from major European and Asian broadcasters.

Guyana is South America's only French-speaking country. Technically an "overseas department" of France, most of its interior is dense rainforest, so most Guianese live along the coastline at the northern end of the country.

The country's only domestic shortwave station, Radiodiffusion Francaise D'Outre-Mer (R.F.O.) Guyane in Cayenne operates 24 hours a day in French on 5055. Its 10 kW signal is rarely heard overseas.

Radio France International has a significant presence in French Guiana, transmitting on more than 50 frequencies in various European and Arabic languages to Europe, Africa, the Middle East and the Americas. RFE also leases its transmitters to several other international broadcasters.

China Radio International targets the Americas with hour-long broadcasts daily in Spanish at 0200 on 13685, in Mandarin at 0300 on 9720, and in English at 0400 on 9730. Between 1800 and 2200, CRI beams various European language broadcasts to Europe and Scandinavia on 6150, 7305, and 9535.

All of Radio Japan's broadcasts from Montsinéry are beamed to various parts of South America, in Spanish, Portuguese and Japanese. Check 9660 from 0300-0430, 11895 at 0500 and 2200, 15590 from 0230-0300 and 1000-1100, and 21600 at 1700.

Swiss Radio International targets Central and North America with a mixture of English, German, Spanish, French, and Italian daily from 0030-0500 on 9905. SRI beams the same language mix to Australia and New Zealand from 0830-1030 on 9885, to South America from 2200-0000 on 11905, and to Africa on 13710 from 2000-2130.

GUYANA

Guyana has the distinction of being the only country on the continent where English is the official language. Known as British Guiana until it gained independence in 1966, Guyana is a microcosm of the tropics, featuring lush rainforests, spectacular waterfalls and a savanna that is home to all manner of wildlife.

The country is in a period of economic recovery, but still has chronic problems with its

basic infrastructure. It suffers from chronic labor shortages, inadequate transportation systems, and shortages of electricity.

The only shortwave facility in the country, Voice of Guyana with 5 kW on 3290 is not the easiest logging, but it has been reported with some regularity around 0400.

PARAGUAY

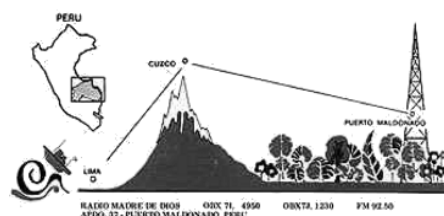
Journalist P.J. O'Rourke once wrote, "Paraguay is nowhere and famous for nothing." O'Rourke later visited and became enamored of the country and its people, but there's no shame in admitting that you don't know much about Paraguay. Neither does the rest of the world. Even its closest neighbors consider it to be something of an enigma. Landlocked deep in South America's center, the country's geographic isolation has been compounded by its political and economic separatism.

Paraguay suffers from the political uncertainty, government corruption, weak economy, and lack of shortwave activity that are common in South America. Radio Nacional del Paraguay offers the only real chance for a logging. Its published frequency is 9735, although it is regularly logged around 9737, where it is often subject to interference from BBC on 9740. Only five other shortwave stations are licensed, but their flea powered signals are either inactive, or operate so irregularly, that hearing them is virtually impossible outside the country's borders.

PERU

Majestic mountains, ancient Incan ruins and the Amazon River basin make up the typical picture of South America's third-largest country. For many SWLs, Peru is a favorite DX target due to its colorful and constantly changing radio landscape.

Government and commercial interests embraced shortwave radio early on in Peru, first in the larger population centers, but later in much greater numbers in small towns and isolated villages where it often served as a means of passing messages between individuals in areas where telephones were nonexistent.



Shortwave radio in Peru is nearly as competitive as commercial FM and AM radio elsewhere in the world. Given unreliable power grids and scarce replacement parts, starting and operating a shortwave station is not cheap. Add the effect of frequent political turbulence and its easy to see why stations come and go in large numbers.

Because not all Peruvian shortwave stations are licensed and transmitters that start out in one town may wind up moving to one or more others, it's impossible to say exactly how many shortwave stations there are in the country. *World Radio TV Handbook* lists about 200. The *CIA World Factbook* says there are 129. The most educated estimates are that at any given time, about 100 stations are actually on the air, about 35 of which have recently been heard with some regularity outside South America. A great many of these operate at 1 kW or less, and often operate outside the recognized shortwave broadcast bands, where reception is greatly affected by much stronger signals from the utility stations that are licensed to use the frequencies in question.

Here are some recently reported Peruvian loggings:

Nominal Frequency	Station	City
3250	Radio Comas	Lima
3340	Radio Altura	Cerro de Pasco
4419	Radio Bambamarca	Bambamarca
4460	Radio Norandina	Celendin
4515	Radio Amistad	Lima
4534	Radio Horizonte	Chiclayo
4748	Radio Huanta 2000	Huanta
4775	Radio Tarma	Tarma
4826	Radio Sicuani	Sicuani
4855	Radio La Hora	Cusco
4904	Radio La Oroya	La Oroya
4914	Radio CORA	Lima

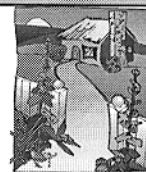
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MACHU PICCHU
CUBO, PERU

4950	Radio Madre de Dios	Puerto Maldonado
4991	Radio Ancash	Huaraz
4995	Radio Andina	Huancayo
5025	Radio Quillabamba	Quillabamba
5039	Radio Libertad	Junín
5046	Radio Integración	Abancay
5236	Radio Apurímac	Abancay
5300	Radio Superior	Bolívar
5460	Radio Bolívar	Bolívar
5470	Radio San Nicolás	Rodríguez Mendoza
5640	Radio Perú	San Ignacio
5678	Radio Ilucán	Cutervo
5855	Radio Univision	Moyabamba
6045	Radio Santa Rosa	Lima
6115	Radio Unión	Lima
6174	Radio Tawantinsuyo	Cusco
6195	Radio Cusco	Cusco
6479	Radio Altura	Huarmaca
6520	Radio Paucartambo	Paucartambo
6535	R. Difusora Huancabamba	Huancabamba
6674	R. Super Nueva Sensación	Huancabamba
6797	Radio Ondas del Río Mayo	Nueva Cajamarca
6956	R La Voz del Campesino	Huarmaca

One of the continent's smallest countries, Suriname is also one of the most culturally diverse, its residents descending from the original Amerindian residents, the Dutch who colon-



Like so many other South American countries, Suriname is primarily dense tropical rainforest, so most of its inhabitants are concentrated along the Atlantic coast. Given this distribution of the population, there isn't much need for shortwave radio when virtually all the residents are within range of local AM and FM signals.

Accordingly, Suriname is one of the most difficult loggings around. Its only shortwave station, Radio Apintie is rarely logged outside the country. It operates with just 350 watts of power on 4991 and 5005, both frequencies that are home to more powerful South American stations as well.

What sets Uruguay apart from other South American countries is its relatively high standard of living, and economic and political stability. Its residents are well educated, and its telecommunications systems among the most advanced on the continent. While other countries in the region feature geographic extremes, Uruguay is primarily made up of rolling hills, with a warm, temperate climate.



There is no external shortwave service and relatively few domestic stations, most running 2.5 kW or less. Stations occasionally reported outside Uruguay include SODRE (Servicio Oficial de Difusión, Radiotelevisión y Espectáculos) Montevideo on 6125 and 9620, Radio Monte Carlo on 6140 and 9595, and Emisora Ciudad de Montevideo on 9650, at 10 kW, the country's highest-powered SW station.

Part mountain, part jungle, part white sandy beaches, Venezuela boasts the world's highest waterfall, South America's largest lake, and a huge variety of exotic plant and animal life. In spite of that rosy exterior, two-thirds of the country's residents live below the poverty level, and drug abuse is a growing problem. The country is heavily dependent on its oil industry, with its volatile price fluctuations.

While it is strictly accurate to say that Venezuela has one of the continent's few external shortwave services, in practice it operates at 50 kW or less and is rarely heard outside the country. For the record, Radio Nacional de Venezuela on 9540 broadcasts an hour of Spanish to the Americas each day at 1800, with repeats at 2100, 0000, 0300, 1100 and 1400.



There are about a dozen domestic stations, only three of which have recently been reported outside of Venezuela: Radio Táchira in San Cristóbal on 4830, Radio Amazonas in Puerto Ayacucho on 4939, and Ecos del Torbes in San Cristóbal on 4980.

Veteran DXer Don Moore has written numerous articles about South American broadcasting, based on his extensive research and travel in the area. Read more at <http://ns4.swl.net/patepluma>. You'll also find links to some other outstanding sites dedicated to Latin American DX.

Like life's other pursuits, listening in on South America gets easier with practice. The more you listen, the more you'll get used to Spanish and Portuguese, and the more you get used to them, the more you'll begin to understand key words and phrases. As your knowledge base grows, you'll begin to learn how to associate various musical forms with their native regions.

Whether your listening is casual or serious,
feliz el escuchar - happy listening!

In addition to the sources cited in the article, the author (*dave@k4cc.net*) wishes to thank the contributors to the North American Shortwave Association (NASWA) loggings database at the NASWeb site www.anarc.org/naswa.

QSL cards are courtesy of Bill McDavitt's SWL QSL Card Museum at www.antique-corner.com/SWLQSL.

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Guide to QSL Addresses: South America

By Gayle Van Horn

Just about the time you *think* you understand the idiosyncracies of QSLing, and proudly boast your verifications from Nepal and Zanzibar ...you decide to begin your southern trek into South America.

It is safe to say each country offers a unique sound, a mood, and an experience. For most of us who enjoy tuning to this region, the lively sounds of sambas take us to the streets of Rio De Janeiro for Carnival, and for pure escapism the intoxicating music of Bolivia's charango.

As a DXer, it is hard to imagine there is much to add to the topic of QSLing, that would offer a distinctive perspective from our directories of Asia and Africa. (*Monitoring Times* Sept. & Oct. 2000). However, a few additional observations may be indicative.

Let's begin with the dichotomy of QSLing South American stations. For the most part, the majority of them could get along fine without our reports, since they are usually interested in their local or national audiences. However, many are equally impressed with a letter from anyone, thousands of miles away, who persevered amid the signal static to write them at his or her own expense! Often such reports are displayed in notebook binders and on studio walls, while one enterprising Peruvian station constructed a display case to showcase their souvenirs from listeners. These are usually the stations that respond with hand painted or gold tasseled pennants and a friendly letter.

Unfortunately, there are stations who could care less and throw hobbyist letters away. One such example comes from a DXer who visited

a station's washroom and discovered old letters being used as paper towels, as well as toilet paper. That might explain your lack of a reply!

The complexities of why the Latins do not respond begin with the reception report. Unless they have an English program segment, letters should be written in Spanish or Portuguese for Brazilian stations. Online language translations services and software (QSL Report, *Monitoring Times*, August 2000) have been a linguistic god-send.

Too many DXers write a "gimmie" report ... a brief, direct request such as, "I heard your station, please verify my report with your QSL card." This approach would be considered rude to those of South American heritage, who pride themselves on cultural values and politeness.

Instead, preface your request with a chatty personal letter about yourself, your family, the listening post or occupation, closing with a friendly request, "if at all possible, I would be very grateful to receive a letter from your station verifying that my report is correct." It is also useful to include a small gift, a picture postcard or two, bumper stickers, a picture of yourself or tourist brochures.

A prepared card QSL should be included with every report. This card, along with your report, contains the date, frequency, time and station name, and can be prepared and printed with your computer. Hopefully, someone on the staff will sign your card and stamp it with the station seal (if they can afford one!) and return it to you. You should enclose a self-addressed envelope or a personal address label to assist

smaller stations operating on a shoestring budget.

Despite what you have read or debated, the recommendation of using International Reply Coupons is a total waste of your money. Exchanging IRCs for postage stamps is nearly impossible in every country. Usually, they can only be exchanged in main post offices in the capital city, or with an official form which must be filled out first – useless for a broadcaster in a Bolivian village in the Andes.

Mint (unused) stamps from the country you're reporting to is your best and most successful alternative. Buying only a few stamps at a time is recommended, due to the risk of their becoming worthless overnight due to fluctuating currency devaluation. For this reason, I do not recommend you "stock up."

For a current price list, we always recommend Bill Plum's DX Service, 12 Glenn Road, Flemington, NJ 08822 USA. Include a self-addressed stamped envelope with your request.

Should you enclose currency? It does appear to be increasing in popularity. For the American DXer, currency is easily obtainable at a fixed value, and it is certainly convenient for the station. However I continue to disagree with many hobbyists who use them despite reported postal theft.

Ready for your trek to South America? Perhaps, armed with some new perspectives, your return rate could surprise you. There will always be those flea watt Peruvians who ignore your letter, but don't despair, the Bolivian from La Paz may be in your mailbox today!

Argentina

Radiodifusión Argentina al Exterior/RAE
Casilla de Correos 555
Correo Central
1000 Buenos Aires, Argentina

Radio Nacional Buenos Aires
Maipú 555
1006 Buenos Aires, Argentina

Radio Nacional Mendoza
(when active)
Av. Emilio Cívít 460
5500 Mendoza, Argentina

Radio Pasteur
(when active)
Casilla 1852
Correo Central
Buenos Aires, Argentina

Radio Rivadavia
(when active)
Arenales 2467
1124 Buenos Aires, Argentina

Bolivia

Radio Abaroa
Calle Nicanor Gonzalo Salvatierra 249
Riberalta Beni, Bolivia

Radio Animas
(when active)
Chocoya, Animas, Potosi, Bolivia

Radio Carlos Palengue
Casilla de Correo 8704
La Paz, Bolivia

Radio Centenario La Nueva
Casilla de Correo 818
Santa Cruz de la Sierra, Bolivia

Radiodifusoras Minería
Casilla de Correo 247
Oruro, Bolivia

Radiodifusoras Trópico
Casilla 60
Trinidad, Beni, Bolivia

Radio Eco
Correo Central
Reyes, Ballivián, Beni, Bolivia

Radio El Mundo
Casilla 1984
Santa Cruz de la Sierra, Bolivia

Radio Emisora Camargo
Casilla 09
Camargo, Provincia Nor-Cinti, Bolivia

Radio Emisora Dos de Febrero
(when active)
Calle Vaca Díez 400
Rurrenabaque, Beni, Bolivia

Radio Emisora Malluka (ex Radio A.N.D.E.S.)
La Voz de los Trabajadores Campesino del
Altiplano
Casilla 16
Uyuni, Potos, Bolivia

Radio Emisora Padilla
Padilla
Chuquisaca, Bolivia

Radio Emisora Villamontes
Avenida Méndez Arcos No. 156
Villamontes, Departamento de Tarija, Bolivia

Radio Fides
Casilla 9143
la Paz, Bolivia

Radio Frontera
(when active)
Casilla 179
Cobija, Pando, Bolivia

Radio Galaxia
(when active)
Calle Beni s/n casi esquina Udarico Rosales
Guayaramerin, Beni, Bolivia

Radio Grigotá
(when active)
Casilla 203
Santa Cruz de la Sierra, Bolivia

Radio Hitachi
(when active)
Calle Sucre 20
Guayaramerin, Beni, Bolivia

Radio Ilimani
Avenida Camacho 1465
Piso 6, Casilla 1042
La Paz, Bolivia

Radio Integración
(when active)
Casilla 7902
La Paz, Bolivia

Radio Juan XXIII
(when active)
Avenida Santa Cruz al Frente de la Plaza
Principal
San Ignacio de Velasco, Santa Cruz, Bolivia

Radio La Cruz del Sur
Casilla 1408
La Paz, Bolivia

Radio La Palabra
Parroquia de Santa Ana de Yacuma
Beni, Bolivia

Radio La Plata
Casilla 276
Sucre, Bolivia

Radio Libertad
(when active)
Casilla 5324
La Paz, Bolivia

Radio Loyola
Casilla 40
Sucre, Bolivia

Radio Mamore
Calle Beni y Mamore
Guayaramerin, Beni, Bolivia

Radio Mauro Núñez
Centro de estudios para el Desarrollo de
Chuquisaca (CEDEC)
Casilla 196
Sucre, Bolivia

Radio Mosoj Chaski
Casilla 4493
Cochabamba, Bolivia

Radio Nacional de Huanuni
Casilla 681
Oruro, Bolivia

Radio Norte
Calle Warnes 195
2° piso del Cine Escorpio
Montero, Santa Cruz, Bolivia

Radio Paititi
Casilla 172
Guayaramerin
Beni, Bolivia

Radio Panoamericana
Casilla 5263
La Paz, Bolivia
(or) Av. 16 de Julio, Edif. 16 de Julio
Of. 902, El Prado, La Paz, Bolivia

Radio Perla del Acre
(when active)
Casilla 7
Cobija, Departamento de Pando, Bolivia

Radio Pio XII
Siglo Veinte
Potosi, Bolivia
(or) Casilla 434
Oruro, Bolivia

Radio San Gabriel
Casilla 4792
La Paz, Bolivia

Radio San Miguel
Casilla 102
Riberalta, Beni, Bolivia

Radio Santa Ana
Calle Sucre No. 250
Santa Ana de Yacuma, Beni, Bolivia

Radio Santa Cruz
Emisora del Instituto Radiofónico Fè y Alegria
(IRFA)
Casilla 672
Santa Cruz, Bolivia
(or) Casilla 3213
Santa Cruz, Bolivia

Radio Sararenda
(when active)
Casilla 7
Camiri, Santa Cruz, Bolivia

Radio Televisión Colonia
(when active)
Correo Central
Yapacani, Santa Cruz de la Sierra, Bolivia

Radio Villamontes
Avenida Méndez Arcos No 156
Villamontes, Departamento de Tarija, Bolivia

Radio Yura
Yura, Provincia Quijarro
Departamento de Potosi, Bolivia

Brazil

Emissora Rural A Voz do São Francisco
Caixa Postal 8
56300-000 Petrolina, Pernambuco, Brasil

Rádio Alvorada/Londrina
(when active)
Rua Senador Souza Naves 9
9 Andar, 86010-921 Londrina, Parana,
Brasil

Rádio Alvorada/Parintins
Alvorada de Parintins
Rua Governador Leopoldo Neves 516
Parintins, Amazonas 69151-440, Brasil

Rádio Alvorada/Rio Branco
Avenida Ceará 2150-Altos de Gráfica Globo,
69900-470 Rio Branco, Acre, Brasil

Rádio Anhanguera/Radio Araguaia
BR-157 Km. 1103
Zona Rural, 77804-970 Araguaia,
Tocantins, Brasil

Rádio Anhanguera
Caixa Postal 13
74823-000 Goiânia, Goiás, Brasil

Rádio Aparecida
Avenida Getúlio Vargas 185
12570-000 Aparecida, São Paulo, Brasil
(or) Caixa Postal 14547
03698-970 Aparecida, São Paulo, Brasil

Rádio Bandeirantes
Caixa Postal 372
Rua Radiantes 13, Morumbi,
01059-970 São Paulo, São Paulo, Brasil

Rádio Baré
Avenida Santa Cruz Machado 170A
69010-070 Manaus, Amazonas, Brasil

Rádio Brasil
Caixa Postal 625
13000-000 Campinas
São Paulo, São Paulo, Brasil

Rádio Brasil Central
Caixa Postal 330
74001-970 Goiânia, Goiás, Brasil

Rádio Brasil Tropical
Caixa Postal 405
78005-970
Cuiabá, Mato Grosso, Brasil

Rádio Caiari
Caixa Postal 104
78900-000 Porto Velho, Rondônia, Brasil

Rádio Canção Nova
Caixa Postal 15
12630-000
Cachoeira Paulista, São Paulo, Brasil

Rádio Capixaba
Caixa Postal 509
29000-000 Vitória, Espírito Santo, Brasil

Rádio Clube de Ribeirão Preto
(when active)
Ribeirão Preto, São Paulo, Brasil

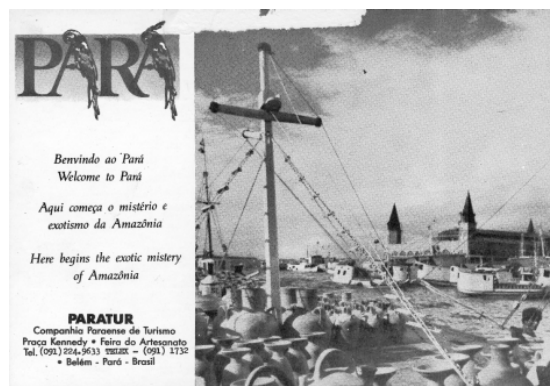
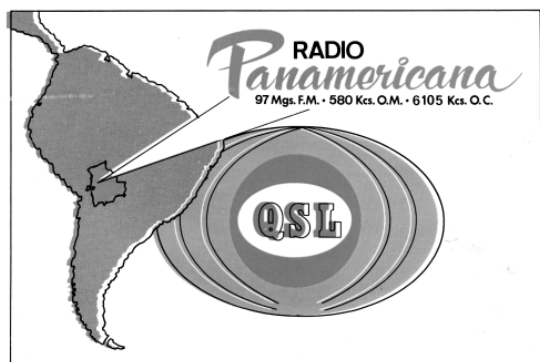
Rádio Clube de Rondonópolis
(when active)
Caixa Postal 190
78700-000 Rondonópolis, Mato Grosso,
Brasil

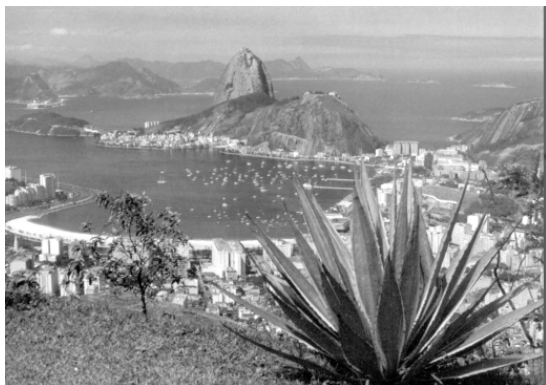
Rádio Clube do Pará
Caixa Postal 533
66000-000 Belém, Para, Brasil

Rádio Clube Paranaense
Rua Rockefeller 1311
Rebouças, Prado Velho
80230-130 Curitiba, Parana, Brasil

Rádio Clube Varginha
Caixa Postal 102
37000-000 Varginha, Minas Gerais, Brasil

Rádio Clube Rondonópolis
(when active)
Caixa Postal 190
78700-000 Rondonópolis, Mato Grosso,
Brasil





Rádio Cultura Araraquara
Avenida Feijó 585/Centro
14601-140 Araraquara, São Paulo, Brasil

Rádio Cultura de Campos
Caixa Postal 79
28100-970 Campos, Rio De Janeiro, Brasil

Rádio Cultura Filadelfia
Rua Antonio Barbosa 1353
Caixa Postal 89
85851-090 Foz do Iguaçu, Parana, Brasil

Rádio Cultura de Foz do Iguaçu
Caixa Postal 84
85852-520 Foz do Iguaçu, Parana, Brasil

Rádio Cultura do Pará
Avenida Almirante Barroso 735
66090-000 Belém, Para, Brasil

Rádio Cultura Ondas Tropicais
Rua Barcelos s/n Praça 14
69020-060 Manaus, Amazonas, Brasil

Rádio Cultura São Paulo
Rua Cenzo Sbrighi 378
05099-900 São Paulo, São Paulo, Brasil

Rádio Difusora Acreana
Rua Benjamin Constant 161
69908-529 Rio Branco, Acre, Brasil

Rádio Difusora Cáceres
(when active)
Caixa Postal 297
78200-000 Cáceres, Mato Grosso, Brasil

Rádio Difusora de Aquidauana
Caixa Postal 18
79200-000 Aquidauana
Matto Grosso Do Sul, Brasil

Rádio Difusora Londrina
Caixa Postal 1870
86000-000 Londrina, Parana, Brasil

Rádio Difusora de Roraima
Avianda Capitão Ene Garcez 830
69304-000 Boa Vista, Roraima, Brasil

Rádio Difusora do Amazonas
Caixa Postal 311
69000-000 Manaus, Amazonas, Brasil

Rádio Difusora do Maranhão
(when active)
Caixa Postal 152
65000-000 São Luis, Maranhão, Brasil

Rádio Difusora Jatai
Caixa Postal 33
(or) Rua de José Carvalhos Bastos 542
75800-000 Jatai, Goiás, Brasil

Rádio Difusora Macapá
(when active)
Caixa Postal 2929
68900-000 Macapá, Amapa, Brasil

Rádio Difusora Macapa
Candido Mendes 525
68900-100 Macapa, Amapa, Brasil

Rádio Difusora, Poços de Caldas
Caixa Postal 937
37701-970 Poços de Caldas, Minas Gerais,
Brasil
(or) Rua Rio Grande do Sul 631
37701-001 Poços de Caldas, Minas Gerais,
Brasil

Rádio 6 de Agosto
Rua Pio Nazário 31
69930-000 Xapuri, Acre, Brasil

Rádio Difusora Taubaté
(when active)
Rua Dr. Sousa Alves 960
12020-030 Taubaté, São Paulo, Brasil

Rádio Educação Rural/Campo Grande
Caixa Postal 261
79002-233 Campo Grande, Mato Gross Do
Sul, Brasil

Rádio Educação Rural/Coari
Praça São Sebastião 228
69460-000 Coari, Amazonas, Brasil

Rádio Educadora Cariri
Caixa Postal 57
63100-000 Crato, Ceara, Brasil

Rádio Educadora da Bahia
Centro de Rua Pedro Gama 413/E
Alto Sobradinho Federação
40230-291 Salvador, Bahia, Brasil

Rádio Educadora de Bragança
Rua Barão do Rio Branco 1151
68600-000 Bragança, Para, Brasil

Rádio Educadora de Guajará Mirim
Praça Maria Correa No. 90
78957-000 Guajará Mirim, Rondônia, Brasil

Rádio Gaucho
Avenida Ipiranga 1075 2º andar, Azenha
90169-900 Porto Alegre Rio Grande Do Sul,
Brasil

Rádio Gazeta, São Paulo
Avenida Paulista 900
01310-940 São Paulo, São Paulo, Brasil

Rádio Globo
Rua do Russel 434-Glória
22213-900 Rio de Janeiro, Rio de Janeiro,
Brasil

Rádio Globo
Rua das Palmeiras 315
01288-900 São Paulo, São Paulo, Brasil

Rádio Guaíba
Rua Caldas Junior 219
90019-900 Porto Alegre, Rio Grande Do Sul,
Brasil

Rádio Guarani
Avenida Assis Chateaubriand 499
Floresta 30150-101 Belo Horizonte, Minas
Gerais, Brasil

Rádio Guarujá
Caixa Postal 45
88000-000 Florianópolis, Santa Catarina,
Brasil

Rádio Inconfidência
Caixa Postal 1027
30650-540 Belo Horizonte Minas Gerais,
Brasil

Rádio Intergração
(when active)
Rua Alagoas 270
69980-000 Cruzeiro do Sul, Acre, Brasil

Rádio IPB AM
Rua Itajai 473
Bairro Antonio Vendas
79041-270 Campo Grande, Mato Grosso Do
Sul, Brasil

Rádio Itatiaia
Rua Itatiaia 117
31210-170 Belo Horizonte, Minas Gerais,
Brasil

Rádio Jornal A Crítica
Caixa Postal 2250
69061-970 Manaus, Amazonas, Brasil
(or) Av. Andre Araujo s/n, Aleixo
69060-001 Manaus, Amazonas, Brasil

Rádio Liberal
Caixa Postal 498
66017-970 Belém, Para, Brasil

Rádio Londrina
Rua Senador S. Naves 9
Londrina, Parana, Brasil

Rádio Marajoara
(when active)
Travessa Campos Sales 370
Cento 66019-904 Belém, Para, Brasil

Rádio Marumby
Caixa Postal 296
88010-970 Florianópolis, Santa Catarina,
Brasil
(or) Rua Angelo Laporta 841
Caixa Postal 62
88020-600 Florianópolis, Santa Catarina,
Brasil

Rádio Marumby-Curitiba/Radio Novas de Paz
Avenida Paraná 1896
82510/000, Curitiba, Parana, Brasil

Rádio Metereologia Paulista
Caixa Postal 91
14940-970 Ibitinga, São Paulo, São Paulo,
Brasil

Rádio Missões da Amazônia
Travessa Ruy Barbosa 142
68250-000 Obidos, Para, Brasil

Rádio Mundial
Rua da Consolidação, São Paulo, São Paulo,
Brasil

Rádio Nacional da Amazônia
Radiobrás
SCRN 702/3 Bloco B Lote 16/18
Ed. Radiobrás 70323-900
Brasília, Distrito Federal, Brasil

Rádio Nacional do Brasil/Radiobrás
External Service
Caixa Postal 08840
70912-790 Brasília, Distrito Federal, Brasil

Rádio Nacional São Gabriel da Cachoeira
Avenida Alvaro Maia 850
69750-000 São Gabriel da Cachoeira,
Amazonas, Brasil

Rádio Novas de Paz
Avenida Paraná 1896
82510-000 Curitiba, Parana, Brasil

Rádio Nova Visão
Rua do Manifesto 1373
04209-001 São Paulo, São Paulo, Brasil

Rádio Oito de Setembro
Caixa Postal 8
13690-000 Descalvado, São Paulo, São
Paulo, Brasil

Rádio Pioneira de Teresina
Rua 24 de Janeiro 150 sul/centro
64001-230 Teresina, Piaui, Brasil

Rádio Poti
(when active)
Caixa Postal 145
59001-970 Natal, Rio Grande De Norte,
Brasil

Rádio Progresso
(when active)
Estrada do Belmont s/n, B° Nacional
78903-400 Porto Velho, Rondônia, Brasil

Rádio Record
Rua São Carlos do Pinhal 696-9b
Andar, 01333-000
São Paulo, São Paulo, Brasil
(or) Caixa Postal 7920
04084-002 São Paulo, São Paulo, Brasil

Rádio Relógio Federal
Rua Paramoco', 131
Ribeira, Ilha do Governador
21930-110 Rio de Janeiro, Rio Janeiro,
Brasil

Rádio Ribeirão Preto
(when active)
Caixa Postal 1252
14025-000 Ribeirão Preto, São Paulo, Brasil
(or) Av. 9 de Julho 600
14025-000 Ribeirão Preto, São Paulo, Brasil

Rádio Rio Grande do Sul
Avenida São Paulo No.722
Bairro Sao Geraldo
Porto Alegre
Rio Grande do Sul, 90.230-160 Brasil

Rádio Rio do Sul/
Sistema LBV Mundial
Rua Doraci N° 90
CEP 01134-020
Bairro, Bom Retiro
São Paulo, São Paulo, Brasil
(or) Legião da Boa Vontade
Rua Sergio Tomas 740
001131-010 Com Retiro, São Paulo, Brasil

Rádio Rio Mar
Rua José Clemente 500
Manaus, Amazonas, Brasil

Rádio Rural Santarém
Rua Floriano Peixoto 632
68005-060 Santarém, Para, Brasil

Rádio São Paulo
Alameda Ministro Rocha Azevedo 395
01410-000 São Paulo, São Paulo, Brasil

Rádio Timbira
(when active)
Rua do Correio s/n
Bairro de Fátima 65030-340
São Luis, Maranhão, Brasil

Rádio Trans Mundial
Caixa Postal 18300
Aeropuerto, 04699-970
São Paulo, São Paulo, Brasil

Rádio Tropical
(when active)
Caixa Postal 23
78600-000 Barra do Garças, Mato Grosso,
Brasil

Rádio Tupi
Avenida Nadir Dias Figueiredo 1329
02110-901 São Paulo, São Paulo, Brasil

Rádio Universo/Rádio Tupi
Caixa Postal 7133
80000-000 Curitiba, Parana, Brasil

Rádio Verdes Florestas
Caixa Postal 53
69981-970 Cruzeiro do Sul, Acre, Brasil

Rádio Voz do Coração Imaculado
(when active)
Caixa Postal 354
75001-970 Anápolis Goiás, Brasil

Chile

Radio Esperanza
Casilla 830
Temuco, Chile

Radio Sante Maria
Apartado 1
Coyhaique, Chile

Radio Nacional de Chile
Casilla 244-V
Santiago, Chile



Radio Triunfal Evangélica
Calle Las Araucarias 2757
Villa Monseñor Larrain
Talagante, Chile

La Voz Christiana
Casilla 490-3
Santiago, Chile
(or) Apartado Postal 2889
Miami, FL 33144 USA

Peru

Estación Tarapota
(when active)
Jirón Federico Sánchez 720
Tarapota, Peru

Estación Wari
Calle Nazareno 108
Ayacucho, Peru

Estación W/Equis
(when active)
Plaza de Armas No. 106 Yurimaguas
Provincia de Alto Amazonas
Loreto, Peru

Frecuencia Lider/Radio Bambamarca
Jirón Chàvez 416
Bambamarca, Hualgayoc,
Cajamarca, Peru

Frecuencia San Ignacio
Jirón Villanueva Pinillos 330
San Ignacio, Cajamarca, Peru

La Super Radio San Ignacio
(when active)
Avenida Victor Larco 104
a un costado del campo deportivo
San Ignacio, Distrito de Sinsicap
Provincia de Otuzco, La Libertad, Peru

La Voz de Anta
Distrito de Anta
Provincia de Acobamba
Departamento de Huancavelica, Peru

Radio Adventista Mundial/La Voz de la
Esperanza
Jirón Dos de Mayo No. 218
Celendin, Cajamarca, Peru

Radio Alegria
Jirón Iquitos s/n
Distrito de Raymond
Provincia de Atalaya
Departamento de Ucayali, Peru

Radio Altura/Cerro de Pasco
Casilla de Correo 140
Carro de Pasco, Pasco, Peru

Radio Altura/Huarmaca
Antonio Raymond 3ra Cuadra
Distrito de Huarmaca
Provincia de Huancabamba, Piura, Peru

Radio Amauta del Perú
(when active)
Jirón Manuel Iglesias s/n
a pocos pasos de la Plazuela San Juan
San Pablo, Cajamarca,
Nor Oriental del Marañón, Peru

Radio América
(when active)
Montero Rosas 1099
Santa Beatriz, Lima, Peru

Radio Amistad
Manzana 1-11, Lote 6
Calle 22, Urbanización, Mariscal Cáceres
San Juan de Lurigancho, Lima, Peru

Radio Ancash
Casilla de Correo 221
Huaraz, Peru

Radio Andahuaylas
Jr. Ayacucho No. 248
Andahuaylas, Apurimac, Peru

Radio Andina
Real 175
Huancayo, Junin, Peru

Radio Apurimac
(when active)
Jirón Cusco 206
(or) Ovalo El Olivo No. 23
Abancay, Apurimac, Peru

Radio Atlántida
Jirón Arica 441
Iquitos, Loreto, Peru

Radio Ayabaca
Jirón Comercio 437
Ayabaca, Huancabamba, Peru

Radio Ayaviri/La Voz de Melgar
(when active)
Apartado 8
Ayaviri, Puno, Peru

Radio Bahía
Jirón Alfonso Ugarte 309
Chimbote, Ancash, Peru

Radio Bolívar
Provincia de Bolívar
Departamento de La Libertad, Peru

Radio Cajamarca
Jirón La Mar 675
Cajamarca, Peru

Radio Chanchamayo
Jirón Tarma 551
La Merced, Junin, Peru

Radio Chaski
Baptist Mid-Missions
Apartado 368
Cusco, Peru
(or) Alameda Pachacútec s/n B-5
Cusco, Peru

Radio Chincheros
Jirón Apurimac s/n
Chincheros, Departamento de Apurimac, Peru

Radio Chota
Jirón Anaximandro Vega 690
Apartado Postal 3
Chota, Cajamarca, Peru

Radio Comas
Avenida Estados Unidos 327
Urbanización Huaquillay
km 10 de la Avenida Túpac Amaru
Distrito de Comas, Lima, Peru

Radio Concordia
(when active)
Av. La Paz 512-A
Arequipa, Peru

Radio Continental
(when active)
Av. Independencia 56
Arequipa, Peru

Radio CORA
Compañía Radiofónica Lima
S.A., Pasco de la República 144
Centro Cívico, Oficina 5, Lima 1, Peru

Radio Cristal
Jirón Ucayali s/n
a un costado de la Carretera Marginal de la
Selva
San Hilarión, Provincia de Picota
Región San Martín, Peru

Radio Cultural Amauta/Bambamarca
(when active)
Jirón Jaime de Martínez 645
Bambamarca, Cajamarca, Peru

Radio Cultural Amauta/Huanta
Cahuide 278
Apartado Postal 24
Huanta, Ayacucho, Peru

Radio Cusco
Saphi 601
Cusco, Peru

Radio del Pacífico
Apartado 4236
Lima 1, Peru

Radio El Sol/Lima
(when active)
Avenida Uruguay 355
7°, Lima, Peru

Radio El Sol/Pucará
Avenida Jaén s/n
Distrito de Pucará
Jaén, Cajamarca, Peru

Radio El Sol de los Andes
Jirón 2 de Mayo 257
Juliaca, Peru

Radio Estación C
Casilla de Correo 210
Mayobamba, San Martín, Peru

Radio Estación Uno
Barrio Altos
Distrito de Pucará
Provincia Jaén
Nor Oriental del Marañón, Peru

Radio Estudio 2000
Distrito Miguel Pardo Naranjos
Provincia de Rioja
Departamento de San Martín, Peru

Radio Frecuencia VH/La Voz de Celendin
Jirón José Gálvez 1030
Celendin, Cajamarca, Peru

Radio Horizonte/Chachapoyas
Apartado 69
(or) Jirón Amazonas 1177
Chachapoyas, Amazonas, Peru

Radio Horizonte/Chiclayo
Jirón Incanato 387 Altos
Distrito José Leonardo Ortiz, Chiclayo
Lambayeque, Peru

Radio Hualgayoc
Jirón San Martín s/n
Hualgayoc, Cajamarca, Peru

Radio Huamachuro
(when active)
Jirón Bolívar 937
Huamachucho, La Libertad, Peru

Radio Huancabamba
(when active)
Calle Unión 610-Barrio Chalaco
Huancabamba, Piura, Peru

Radio Huanta 2000
Jirón Gervasio Santillana 455
Huanta, Peru

Radio Huarmaca
Av. Grau 454
detrás de Inversiones La Loreta
Distrito de Huarmaca
Provincia de Huancabamba
Región Grau, Peru

Radio Ilucán
Jirón Lima 290
Cutervo, Región Nororiental del Marañón,
Peru

Radio Imagen
Casilla de Correo 42
Tarapota, San Martín, Peru
(or) Apartado 254
Tarapota, San Martín, Peru

Radio Integración
Av. Seoane 200
Apartado Postal 57
Abancay, Departamento de Apurimac, Peru

Radio Internacional del Perú
(when active)
Jirón Bolognesi 532
San Pablo, Cajamarca, Peru

Radio Interoceánica
(when active)
Provincia de Azángaro
Departamento de Puno, Peru

Radio Jaén/La Voz de la Frontera
Calle Mariscal Castilla 439
Jaén, Cajamarca, Peru

Radio J.S.V
Jirón Aguilar 742-744
Huánuco, Peru

Radio Juliaca/La Decana
Ramón Castilla 949
Apartado Postal 67
Juliaca, San Román, Puno, Peru

Radio JVL
Jirón Túpac Amaru 105
Consuelo, Distrito de San Pablo

Radio La Hora
Av. Garcilaso No. 411
Wanchaq, Cusco, Peru

Radio La Inmaculada
Parroquia La Inmaculada Concepción
Frente de la Plaza de Armas
Santa Cruz, Provincia de Santa Cruz
Departamento de Cajamarca, Peru

Radio Lajas
Jirón Rosendo Mendivil 589
Lajas, Chota, Cajamarca
Nor Oriental del Marañón, Peru

Radio La Merced
Junin 163
La Merced, Junin, Peru

Radio La Oroya
Calle, Lima 190
Tercer Piso Of. 3
Apartado Postal 88
La Oroya, Provincia de Yauli
Departamento de Junin, Peru

Radio La Voz de Chiriacó
(when active)
Jirón Ricardo Palma s/n
Chiriacó, Distrito de Imaza
Provincia de Bagua
Departamento de Amazonas, Peru

Radio La Voz de Huamanga
(when active)
Calle El Nzaareno
2° Pasaje No. 161
Ayacucho, Peru

Radio La Voz de la Selva
Abato 255
Casilla de Correo 207
Iquitos, Loreto, Peru

Radio La Voz de las Huarinas
Barrio El Altillo
Huancabamba, Piura, Peru

TARJETA DE VERIFICACION

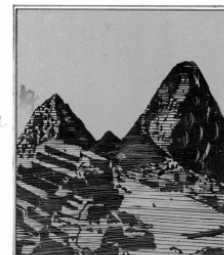
Confirmamos su recepción de fecha ...31...
de AGOSTO... de 19.86... de nuestra
emisora. Onda Media OBZ-4-N, 880 Kcs.,
con potencia de 50 Kwts., Onda Corta
OBZ-4-O, 6.115 Kcs., con potencia de 10
Kwts. La que encontramos correcta y
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Radio La Voz de Oxapampa
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Radio La Voz de San Juan
28 de Julio 420
Lonya Grande
Provincia de Utcubamba
Región Nororiental del Marañón, Peru

Radio La Voz de Campesino
Av. Piura 1015
Pampa Alegre
San Miguel de El Faique
Provincia de Huancabamba, Peru

(or) Jiron Alfonso Ugarte 109
Esquina del Parque Leoncio Prado
Huarmaca, Huancabamba, Piura, Peru

Radio La Voz del Marañón
(when active)
Jirón Bolognesi 130
Barrio La Alameda, Cajamarca
Nor Oriental del Marañón, Peru

Radio Libertad de Junin
Cerro de Pasco 528
Apartado Postal 2, Junin, Peru

Radio Lider
Portal Belén 115
2° piso, Cusco, Peru

Radio Lircay
(when active)
Barrio Maravillas, Lircay
Provincia de Angares, Huancavelica, Peru

Radio Los Andes/Huamachuco
(when active)
Pasaje Damián Nicolau 108-110
2° piso, Huamachuco, La Libertad, Peru

Radio Los Andes/Huarmaca
Huarmaca, Provincia de Huancabamba
Región Grau, Peru

Radio LTC
(when active)
Jirón Unión 242
Juliac, Puno, Peru

Radio Luz y Sonido
Aparto 280
Huánuco, Peru
(or) Jirón Dos de Mayo 1286
Oficina 205, Huánuco, Peru

Radio Madre de Dios
D.A. Carrió 387
Apartado Postal 37
Puerto Maldonado, Madre de Dios, Peru

Radio Majestad
Calle Real 1033
Oficina 302
Huancayo, Junin, Peru

Radio Marañón
(when active)
Apartado 50
Jaén, Cajamarca, Peru

Radio Marginal
San Martín 257
Tocache, San Martín, Peru

Radio Máster
Jirón 20 de Abril 308

Mayobamba, Departamento de San Martín
257, Peru

Radio Melodia
San Camilo 501
Arequipa, Peru

Radio Mi Fontera
Calle San Ignacio 520
Distrito de Chirinos
Provincia de San Ignacio
Región Nor Oriental del Marañón, Peru

Radio Moderna
Jirón Arequipa 323
2° piso, Celendin, Cajamarca, Peru

Radio Mundial Adventista
Colegio Adventista de Titicaca
Casilla 4, Juliaca, Peru

Radio Mundo
Calle Tecte 245
Cusco, Peru

Radio Municipal de Cangallo
(when active)
Concejo Provincial de Cangallo
Plaza Principal No. 02
Cangallo, Ayacucho, Peru

Radio Nacional del Perú
Avenida José Gálvez
1040 Santa Beatriz, Lima, Peru

Radio Naylamp
Avenida Andrés Avelino Cáceres 800
Lambayeque, Peru

Radio Nor Andina
Jirón José Gálvez 602
Celendin, Cajamarca, Peru

Radio Nor Peruna, Emisora Municipal
Jirón Ortiz Arrieta 588
Ier, piso del Concejo Provincial de
Chachapoyas
Chachapoyas, Amazonas, Peru

Radio Onda Inperial
Calle Sacsayhuamán K-10
Urbanización Manuel Prado
Cusco, Peru

Radio Onda Sensación
Cadena Radial Nuevo Siglo
Panamericana Norte km. 361
Urbanización Manuel Prado, Cusco, Peru

Radio Ondas del Huallaga
Jirón Leoncio Prado 723
Apartado Postal 343
Huánuco, Peru

Radio Ondas del Río Marañón
Jirón Amazonas 315
Distrito de Aramango
Provincia de Bagua, Departamento de
Amazonas
Región Nororiental del Marañón, Peru

Radio Ondas del Río Mayo
Jirón Huallaga 348
Nueva Cajamarca, San Martín, Peru

Radio Ondas del Surorient
Jirón Ricardo Palma 510
Quillabamba, La Convención, Cusco, Peru

Radio Oriente

Vicariato Apostólico, Calle Progreso 114
Yurimaguas, Loreto, Peru

Radio Origen
(when active)
Acobamba, Departamento de Huancavelica,
Peru

Radio Paccha
(when active)
Calle Mariscal Castilla 52
Paccha, Provincia de Chota
Departamento de Cajamarca, Peru

Radio Panorama
Centro-poblado Recopampa
Distrito de Sorachuco
Provincia de Cuzco
Departamento de Cajamarca,
Región Autónoma del Marañón, Peru

Radio Paucartambo/Emisora Municipal
Plaza de Armas 124
Paucartambo, Cusco, Peru

Radio Perú
Jirón Atahualpa 191
San Ignacio, Región Nororiental del
Marañón, Peru

Radio Power
(when active)
Jirón 20 de Abril 467
Mayobamba, San Martín, Peru

Radio Quillabamba
Apartado 76
Quillabamba, La Convención, Cusco, Peru

Radio Regional
Jirón Grau s/n frente al Colegio Nuestra
Señora del Carmen, Celendin, Cajamarca,
Peru

Radio Reina de la Selva
Jirón Ayacucho 944
Plaza de Armas, Chachapoyas
Región Nor Oriental del Marañón, Peru

Radio San Antonio
Parroquia San Antonio de Padua
Parroco Pbro. Frans Windischer Raffetseder
Plaza Principal s/n
Callalli, Depto Arequipa, Peru

Radio San Francisco Solano
Parroquia de Sándor
Calle San Miguel No. 207
Distrito de Sándor, Huancabamba, Piura,
Peru

Radio San Ignacio
Jirón Victoria 277
San Ignacio, Región Nororiental del
Marañón, Peru

Radio San Juan
28 de Julio 420
Lonya Grande, Provincia de Utcubamba
Región Nororiental del Marañón, Peru

Radio San Miguel
Av. Huayna Cápac 146
Huácho, Cusco, Peru

Radio San Miguel Arcángel
Jirón Bolívar 356
a media cuadra de la Plaza de Armas
Provincia de San Miguel, Cajamarca, Peru

Radio San Miguel de El Faique
Distrito de El Faique
Provincia de Huancabamba
Departamento de Piura, Peru

Radio San Nicolás
Jirón Amazonas 114
Rodríguez de Mendoza, Peru

Radio Santa Rosa
Jirón Camaná 170
Casilla 4451
Lima 1, Peru

Radio Santiago
Municipalidad Distrital de Río Santiago
Puerto Galilea
Provincia de Condorcanqui, Amazonas, Peru

Radio Satélite
Jirón Cutervo No. 543
Provincia de Santa Cruz
Cajamarca, Peru

Radio Selecciones
Chuquibamba
Provincia de Condesuyos, Arequipa, Peru

Radio Sicuani
Jirón 2 de Mayo 206
(or) P.O. Box 45, Sicuani, Peru
Sicuani, Canchis, Cusco, Peru

Radio Soledad
Centro Minero de Retama
Distrito de Parcoy
Provincia de Pataz, La Libertad, Peru

Radio Sudamérica
Jirón Ramón Xastilla 491
tercer nivel
Plaza de Armas, Cutervo, Cajamarca, Peru

Radio Superior
Jiron, San Martín 229
Provincia de Bolívar
Departamento de La Libertad, Peru

Radio Tacna
Aniceto Ibarra 436
Casilla de Correo 370
Tacna, Peru

Radio Tarma
Jirón Molino del Amo 167
Apartado Postal 167
Tarma, Peru

Radio Tawantinsuyo
Av. Sol 806
Cusco, Peru

Radio Tayacaja
Correo Central
Distrito de Pampas
Tayacaja, Huancavelica, Peru

Radio Tingo Maria
(when active)
Jirón Callao 115
(or) Av. Raimondi No. 592
Casilla de Correo 25
Tingo Maria, Leoncio Prado
Departamento de Huánuco, Peru

Radio Tropical
Casilla de Correo 31
Tarapoto, Peru

Radio Unión

Apartado 833
Lima 27, Peru

Radio Uno
Av. Balta 1480
3 er piso, frente al Mercado Modelo
Chiclayo, Peru

Radio Victoria
Reynel 320
Minones Bajo, Lima 1, Peru

Radio Virgen de Carmen/ RVC
Jirón Virrey Toledo 466
Huancavelica, Peru

Radiodifusoras Huancabamba
Calle Unión 409
Huancabamba, Piura, Peru

Radiodifusion Paratón
Jirón Alfonso Ugarte 1090
contiguo al Parque Leoncio Prado
Huarmaca, Huancabamba, Piura, Peru

Paraguay

Radio Encarnación
(when active)
Gral. Artigas casi
Gral. B. Caballero
Encarnación, Paraguay



Radio Guairá
(when active)
Alejo García y Presidente Franco
Villarrica, Paraguay

Radio Nacional de Paraguay
Blas garay 241 entre Yegros e Iturbide
Asunción, Paraguay

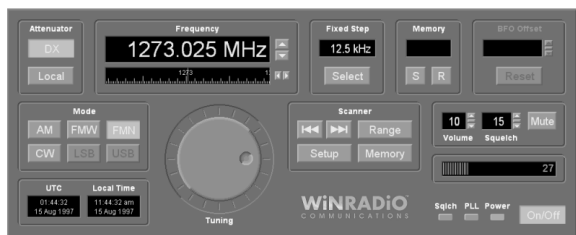
Uruguay

Emisora Ciudad de Montevideo
(when active)
Canelones 2061
11200 Montevideo, Uruguay

La Voz de Artigas
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Radio Monte Carlo/Radio Oriental
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San Francisco's Radio Heritage

By Leon Fletcher

photos courtesy of John F. Schneider

Historians still disagree about which was the first radio station to broadcast regularly scheduled programs in the United States. KDKA, Pittsburgh, usually gets the honor for going on the air November 2, 1920. Others say it was WGI, Boston, reportedly started eight months earlier, in March.

But knowledgeable folks in the San Francisco bay area scoff at those claims. They know that it was in San Jose – 90 miles south and considered even then to be a part of San Francisco's sphere – that the nation's first broadcast was transmitted, in 1909.

That year was ripe with innovation. Perry reached the North Pole. The first transcontinental flight was made. Sikorsky developed the helicopter. The Boy Scouts of America was incorporated. New Mexico was admitted as the 47th state, Arizona as the 48th. Parcel post service started. Ford introduced the Model T. The Radio Club of America began. The first SOS by radio was sent by an American ship.

And in San Jose, Dr. Charles David Herrold – called “Doc,” of course – established the Herrold College of Engineering and Wireless.

That school soon began broadcasting occasional tests of electronic gear developed by faculty and students. Listeners hearing those signals phoned the college to report their reception and ask when the station would be on the air again.

A student at the school, Ray Newby, then 16 years old, Herrold's assistant from 1908 until 1923, said, “It was not long until we got into a pre-arranged schedule so that we would have listeners that could report to us.”

The resulting schedule – half-hour broadcasts at 9pm Wednesdays

– became “almost a religion with Professor Herrold,” according to Newby.

Documentation

The case for Doc's station being the first to broadcast on a schedule was endorsed on a 1994 PBS documentary by wireless historian Bart Lee, who said, “There's no question about that. He was first.”

On that same program, Gordon Greb, Herrold researcher, said he interviewed Lee De Forest in 1959 and asked, “Do you believe that Herrold's station deserves credit to be the world's first broadcasting station?” De Forest's reply, “I sure do.”

By 1910 the station had expanded its broad-

casting from transmitting brief, simple test messages, to airing musical recordings played on a phonograph. News was added by reading articles from local newspapers.

Doc's wife, Sybil, was one of the on-air voices. That made her, she later claimed, “the first woman to ever broadcast a program.”

One of her shows, “Little Ham Program,” featured records she borrowed from a local music store, Sherman Clay. Grandson Stephen True said the store “loved it because the next day they would sell out of whatever she would play over the radio.” Thus the power of what would become radio advertising was documented early.

Sybil also introduced the first contests for radio listeners. She announced there would be prizes awarded each week to folks who came to the station to report hearing the transmissions. Often the prizes were little pieces of galena, so small they were usually handled with tweezers. Galena was lead ore, needed in crystal sets, the first widely-used radio receivers.

Before stations had call signs, Doc identified his station by announcing, “This is San Jose calling.” Soon the government required stations to use call letters, and allowed stations to select their own calls. Doc picked “FN,” later changed to “SJN.” In 1920, the Commerce Department began issuing licenses for broadcast stations and on December 9, 1921, Doc's station received the call sign KQW.

In 1937, KQW joined the just-established Mutual-Don Lee Network; that association ended in 1941. In 1949, the Columbia Broad-



The cast of San Francisco's based early soap opera, “One Man's Family.” First broadcast on Friday, April 29, 1932, it continued for 27 years, until May 8, 1959; aired nationally for much of that time. The dress was typical of actors and actresses in the early days of radio; announcers often wore tuxedos, even when there were no studio audiences.



Carleton E. Morse, reviewing bound copies of some of the scripts he wrote for such programs as "One Man's Family" and "I Love a Mystery." "I Love Adventure," "Adventures by Morse," and "NBC Mystery Serial." Morse died May 24, 1993, in Sacramento, CA, at age 92.

casting System bought KQW, changed its call to KCBS, and the station was established as a major outlet in San Francisco.

In 1968, KCBS began broadcasting news only. Today it continues to be the primary radio news source for millions of listeners daily.

Broadcasting Grows

But back in the early 1920s in San Francisco, other radio stations were also going on the air.

Famed electronics inventor Lee De Forest started 6XC, later known as KZY. His station went on the air in May 1920, six months before KDKA, that station so widely believed to be the first. De Forest's station featured three half-hour concerts a day. Music was by a theater organist and by Hermann Heller's Symphony Orchestra.

Another pioneering San Francisco station, KDN, started broadcasting in June 1921, as 6XG. It was one of the first of several radio stations that transmitted from the Fairmont Hotel, ideal for broadcasting because of its location atop of San Francisco's Nob Hill. Former ship's radio officer Alan Cormack was hired to be the on-air personality. He played music on an old wind-up phonograph that had to be rewound frequently.

Another early radio station in San Francisco was KPQ, started by former Navy radioman Joe Martineau. He convinced the owners of Hale Brothers Department Store – Francis, Marshall,

and Reuben – to install a station in that store and let him operate it. The first program was on the air on April 17, 1922.

In 1924, KFRC began broadcasting with an exceptionally strong signal, heard on the East coast, Hawaii, Alaska, even New Zealand. Yet its transmitter was considered "relatively low-powered" and its antennas only modest. Engineers studied the phenomenon, could not agree on why the signal was so powerful, but decided that perhaps the building which housed the station, the Whitcomb Hotel, might have been situated on land that was an ideal ground – that is, connection with the earth.

One of KFRC's announcers, Dean Maddox – also known as "Buddha" – became my idol. One day I watched him present one of his many man-on-the-street interviews. Afterwards, I asked him for an autograph. I was but a child and had no paper or pen with me. He smiled broadly, signed the script for a commercial he'd just delivered, and gave it to me.

KFRC aired many performers who became famous, including Don Wilson, well-known later as Jack Benny's announcer. Other voices heard in the early days of that station were Morey Amsterdam, Ben Bederet – well-known female announcer – Ralph Edwards, Merv Griffin, Art Linkletter, John Nesbitt, and Harold Peary.

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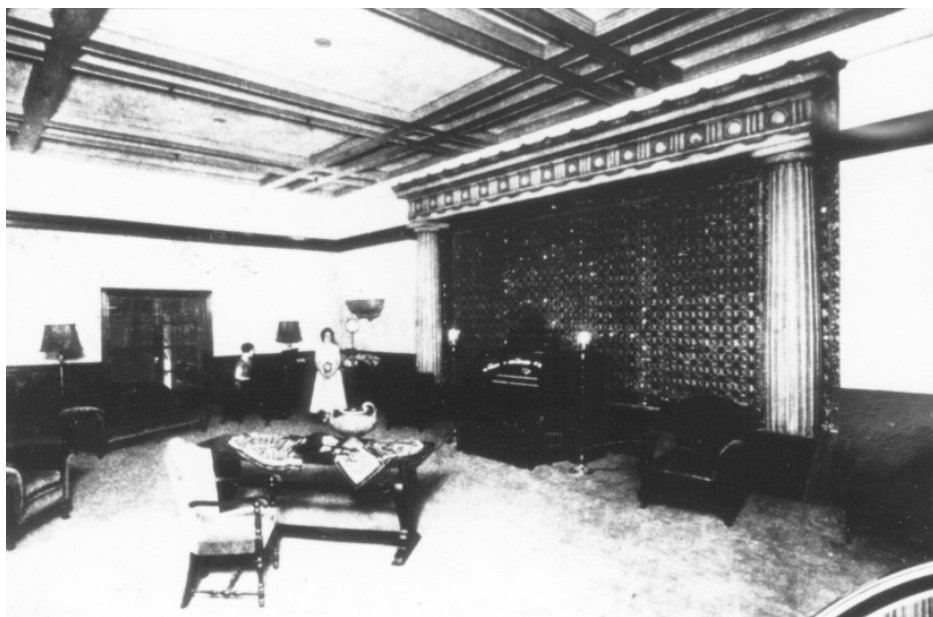
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KPO called this "The Grand Studio," claimed it was "large enough to hold a 90-piece orchestra." This photo was probably taken in 1925, when the station moved into new facilities – ten rooms in Hale Brother's Department Store. Sometime in the next decade rugs were hung from the walls to help sound control.

More New Stations

Radio grew fast in the 1920s. Some stations were on the air for but a few months, then folded. By 1929 eleven radio stations and their spots on

the dial (kilocycles) were listed in local newspapers:

KTAB - 550	KFRC - 610	KPO - 680
KGO - 790	KLX - 880	KFWI - 930
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Shopper's Hour	Kiddie's Orchestra	Farm Features
Mystery Hour	Studio Concert	Night Owls

Big Time

San Francisco soon joined New York, Chicago, and Los Angeles as one of the nation's leading centers of radio programming. San Francisco's major hit program was *One Man's Family*.

That series started on Friday, April 29, 1932, a half-hour program aired at 9:30pm PST; it became the longest-running radio drama in history – continuing for 27 years, until May 8, 1959. Written by Carleton E. Morse, the show included 35 characters of the fictional aristocratic San Francisco family, the Barbours. In the story, they lived in the prestigious Sea Cliff area of San Francisco. One actor, Anthony Smythe, played the father, Henry Barbour, throughout the entire series.

The success of that show sparked Carleton E. Morse to write the spin-off program, *I Love a Mystery* – billed as a new "adventure thriller." A newspaper guide to radio programs of those days claimed the series presented "hair-raising, teeth-chattering thrillers that have all America on the edge of its chair!!!"

First aired in January 1939, on NBC's Pacific Coast stations, by 1940 it was a nation-

wide sensation. Many of the actors in Morse's *One Man's Family* show also appeared in this new mystery. From it came three movies, a comic strip, and a TV series pilot.

Famed Actor

Jack Webb was another nationally-famous radio personality with a San Francisco broadcasting heritage. He began there as a radio announcer. After he was well-known, he told interviewers, "My early radio career (in San Francisco) was as romantic as playing post office in an old maids' club. I got to the station every day at 4:30am, pushed a button and said, 'And now back to New York.'"

Webb's next step to fame was playing the title role in the radio drama *Pat Novak for Hire*. Created by San Francisco writer Dick Breen, it cast Webb as a wise-cracking detective. The series was broadcast in San Francisco for 23 weeks, then moved to Hollywood. There, Webb said later, "I was everybody's hot cake."



Paul Carson, organist, played the theme, "Destiny Waltz," for the San Francisco radio series "One Man's Family." Known as "The Mus-ing Organist," he played on many other broadcasts. His own long-running radio series of organ music was called "The Bridge to Dreamland." He started his musical career at age five, paying hymns on a small reed organ.

Before long he was starring in TV's *Dragnet* – a show that grew out of his previous detective series. Even today, more than a half-century later, *Dragnet* is rerun on many stations. Webb also went on to star in many other radio and TV shows and in feature films.

Today, there are 38 radio stations on the air in San Francisco, plus numerous other stations in the many towns in the bay area. Such a radio heritage helps document San Francisco's claim as "The city that knows how!"



Ernie Smith, long-time sportscaster for KPO, wrote in his memoirs, "I broadcast the first baseball game on the Pacific Coast from a make-shift aerie perched in the rafters of Kezar Pavilion," a prominent San Francisco playing field. Earlier Smith had been a Pacific Coast swimming champion for five years and won a national water polo title in 1920.

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<input type="checkbox"/>	Universal Telescoping	ANT 19	\$14.95
<input type="checkbox"/>	AOR DA3000 Aerial Discone	ANT 11	\$129.00
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<input type="checkbox"/>	Alinco battery case, 4 "AA"	BAT 22	\$9.95
<input type="checkbox"/>	Alinco, car lighter cable w/filter	DCC 14	\$23.95
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<input type="checkbox"/>	Icom R2 soft case	CAS 20	\$29.95
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<input type="checkbox"/>	Universal Cigarette Adaptor	DCC 3	\$12.95

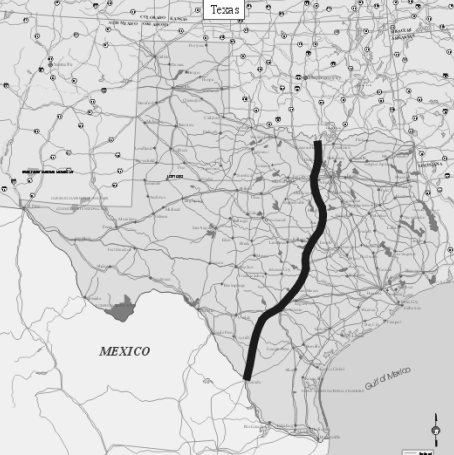
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Roadtrip: Scanning Interstate-35

By John Mayson

It's probably safe to say all of us have found ourselves on a lengthy road trip. We pack up the car, truck, or van and set off on the open road to visit relatives, national monuments, and amusement parks.

We eagerly await the green light that'll allow us to make that left turn onto the interstate and finally start our journey. However our initial excitement is always tempered by bad weather, heavy traffic, accidents, or even sheer boredom. Many of us bring scanners along to help break up the monotony of the drive and give a little insight into our surroundings.

Before modern radio systems swept the nation we could use the "service scan" feature on our scanners. The Federal Communications Commission (FCC) allocated certain frequencies to various functions such as fire fighting, law enforcement, business, towing services, etc. Scanner manufacturers would have a preset button allowing the listener to scan all fire or police frequencies. Often we didn't know exactly where what we were hearing was taking place, but sometimes could figure it out. Sometimes.

Today we're seeing more and more radio systems that do not lend themselves to service scanning. These include trunking and 800 MHz conventional, plus we're seeing spectrum reallocations and 12.5 kHz spacing on the VHF bands.

Have you ever been driving down the highway and seen a police car zip down the road in the other direction? Have you tried, while driving at 70 mph, to tune around hoping to hear what's happening? Was that a local cop? A sheriff's deputy? State police or highway patrol? If you're not familiar with the liveries of the local patrol cars or the setup of the local radio systems, you're probably out of luck.

You're back in luck!

This is the first article in what I hope will be a periodic feature in *Monitoring Times*. We will profile a major corridor of our highway system, focusing mainly on well-traveled interstates. In addition to frequency and talkgroup information, we will offer tips for programming your scanner ahead of time for maximum enjoyment on the road.

Since this series is targeted to highway drivers, the focus will be on the towns, cities, counties, and parishes through which interstates pass. In busy metropolitan areas we will list only the most common dispatch, tactical, and traffic frequencies and talkgroups. Readers will be directed to a web site or other publication for a more thorough description of metropolitan areas.

I-35 in Texas

I'm kicking this off by profiling an interstate highway here in my own backyard, I-35 in Texas. It starts in Laredo about half-a-mile from the border with Mexico. It passes through San Antonio, Austin, Waco, the Dallas/Fort Worth area, then on into Oklahoma. This stretch of I-35 is part of the so-called NAFTA Highway that connects Canada, the United States, and Mexico. Laredo and its cross-river Mexican counterpart Nuevo Laredo are both major ports of entry for goods moving between our two countries.

WEBB COUNTY

Laredo is the principal city in Webb County and serves as the county seat.

Webb County Sheriff's Office

Ch	Output	Input	Comments
1	155.700	154.680	Dispatch
2	154.785	simplex	Talk

Laredo Police Department

155.250, 155.655, 155.850

Laredo Fire Department

154.445	154.130	Dispatch
154.190		

LA SALLE COUNTY

La Salle County Sheriff's Office

155.565	154.830	186.2	Dispatch
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FRIO COUNTY

Frio County Sheriff's Office

155.685	154.800	203.5	Dispatch
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Pearsall Police Department

154.965 simplex

MEDINA COUNTY

Medina County Sheriff's Office

155.640	154.755	203.5	Dispatch
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ATASCOSA COUNTY

Atascosa County Sheriff's Office

155.730	154.770	203.5	Dispatch
155.670	Simplex		Talk

Atascosa County & Lytle Fire Department

153.950 simplex

BEXAR COUNTY

Bexar County is home to a building you will always remember. It's called the Alamo. San Antonio is the county seat of Bexar County and one of the largest cities in the nation. At press time, Bexar County still uses their Motorola Type I TRS (trunked radio system), but they are building an EDACS digital system that Bexar County, San Antonio and other cities will use.

Motorola Type I Analog s13, s12, s12856.2625, 856.4625, 856.7625, 856.9625, 857.2625, 857.4625, 857.7625, 857.9625, 858.2625, 858.4625, 858.7625, 858.9625, 859.2625, 859.4625, 859.7625, 859.9625, 860.2625, 860.4625, 860.7625, 860.9625 MHz

Bexar County Sheriff's Office

500-1 1A	East Patrol
500-2 1B	West Patrol
500-3 1C	Information
1D	
1E	
1F	
1G	
2A	
2B	Prisoner Transport
2C	Auto Theft Task Force
2D	
2E	
2F	
2G	
2H	

San Antonio Police

000-1	North Patrol
000-3	West Patrol
000-5	South Patrol
000-6	East Patrol
000-7	Central Patrol
000-8	Traffic Patrol
000-9	Information
000-2 1	Bravo
000-4 1	Delta
000-10 1	Juliet
000-11 1	Kilo
000-12 1	Lima
000-13 1	Mary
000-14 1	November
000-15 1	Oscar
600-1 4	Alpha (Homicide)
600-2 4	Bravo (Vice)
600-3 4	Charlie (Auto Theft)
600-4 4	Delta (Detectives)
600-5 4	Echo (Rape)
600-6 4	Foxtrot

600-7 4 Gulf (K9/SWAT)
 600-8 4 Hotel
 600-9 4 India
 600-10 4 Juliet (Gangs)
 600-11 4 Kilo (Academy)
 600-12 4 Lima
 600-12 4 Mary
 600-13 Park Rangers

San Antonio Fire/EMS

400-1 1A Fire Dispatch
 400-2 1B Fireground Ops
 400-3 1C Fireground
 400-4 1D Fireground
 400-5 1E Fireground
 400-6 1F Maintenance
 400-7 1G EMS Dispatch
 400-8 1H EMS Information
 400-9 1I Arson
 400-10 1J Fire Inspectors
 400-11 1K Fireground
 400-12 1L Fireground
 400-13 1M EMS & AirLife
 400-14 1N EMS Tactical
 400-15 1O Fireground

GUADALUPE COUNTY

Guadalupe County Sheriff's Office

Output	Input	Comments
155.070	159.030	Dispatch
155.550	Simplex	Talk

Guadalupe County Fire Department

154.310 simplex

COMAL COUNTY

Comal County Sheriff's Office

Output	Input	CTCSS	Comments
156.000	153.965	203.5	Channel 1
155.595	154.710		Channel 2
159.150	Simplex		Talk

Comal County Fire Department

154.295 153.830 203.5 Dispatch

New Braunfels Police Department

155.190 ??? Dispatch

New Braunfels Fire Department

154.310 151.040 Dispatch

HAYS COUNTY

San Marcos, the county seat, uses the Lower Colorado River Authority's (LCRA) 900 MHz EDACS system exclusively. The Sheriff's Office is also on the LCRA system, but still uses its VHF repeater system, which is repeated on the LCRA system.

LCRA system in LCN order:

1=935.4625, 2=935.9250, 3=937.9750,
 4=939.1500, 5=939.5000

02-141 Hays County Sheriff's Office (155.865 simulcast)

02-142 Hays County Sheriff's Office

02-136 Hays County Intercity

04-051 San Marcos Police Department Dispatch

04-052 San Marcos Police Department

04-053 San Marcos Police Department

04-055 San Marcos Police Department

04-056 San Marcos Police Department

Conventional Frequencies

Southwest Texas State University Police

155.415 (154.650 input)

Hays County Fire Department

154.385 (153.770 input)

158.745 (155.055 input)

Hays County EMS

155.895 (153.875 input)

TRAVIS COUNTY

Travis County is home to Austin, the state capital, and the University of Texas. Austin uses conventional UHF frequencies while the county and most other of the county's communities use VHF. Presently Austin has proposed a \$70 million Motorola digital TRS for all of Travis County. The frequencies have been licensed, but realistically 2002 would be the earliest we'd see this system in place.

For more complete information about Travis County, visit http://www.qsl.net/kc4vjo/radio/tx_travis.html.

Austin Police Department

Ch	Output	Input	Notes
1	460.400	465.400	Frank sector (southeast)
2	460.100	465.100	Adam sector (northwest)
3	460.450	465.450	Baker sector (central & west)
4	460.325	465.325	Edward sector (north-east)
5	460.175	465.175	Charlie sector (east)
6	460.275	465.275	David sector (southwest)
7	460.025	465.025	Information
8	460.400	465.500	Information

Austin Fire Department

153.950	154.235	Metro-3 Notification
453.775	458.774	Firecom 1
453.150	458.150	Firecom 2
453.500	458.500	Firemed 3
453.100	458.100	Firecom 4
453.450	458.450	Alarm
453.900	458.900	Firecom 5
453.275	458.275	Station Paging
453.675	458.675	Airport

Austin EMS

462.975	467.975	Dispatch
462.950	467.950	Secondary Paging

Travis County Sheriff's Office

1	154.085	156.030	North Dispatch
2	153.935	155.955	Talk
3	155.310	156.090	South Dispatch
6	154.845	155.640	Constable

Travis County Fire Control Departments

154.400	153.830	Travis County Fire Control Ch 1
154.340	Simplex	Travis County Fire Control Ch 2
154.205	153.890	Southeast Travis County Fire Control Ch 1
154.325	Simplex	Southeast Travis County Fire Control Ch 2
153.980	156.120	Travis County Rural Fire District Ch 1
154.370	Simplex	Travis County Rural Fire District Ch 2

Travis County EMS

155.715 153.995 Dispatch & STAR Flight

University of Texas at Austin Police

1	155.580	154.770	Dispatch
2	155.820	Simplex	Channel 2

Pflugerville Police Department

155.415 (simplex)

Pflugerville Fire Department

1	154.145	159.060	Dispatch
2	153.920	Simplex	Channel 2

WILLIAMSON COUNTY

Williamson County owns a Motorola Type II analog TRS that it uses along with the cities of Round Rock and the county seat, Georgetown. Other cities still rely on their VHF systems.

For more complete information, visit http://www.qsl.net/kc4vjo/radio/tx_williamson.html.

Williamson County TRS (Motorola Type II)

854.9875, 856-860.9875, 856-860.9625

Williamson County Sheriff's Office

3248 Dispatch
 3280 Call 2
 3312 Traffic & DPS
 3376 Support
 3408 Talk 1
 3440 CID 1
 3536 Tac
 3568 Tac 1
 3600 Tac 2
 3632 Tac 3
 3664 Talk 1
 3696 Constable Dispatch
 3728 Constable Warrants
 3760 Supervisors

Williamson County EMS

3792 Dispatch
 3952 Scene 1

2032 Scene 2
 5104 Fire Link
 3824 Admin
 3856 Round Rock Hospital
 3888 Georgetown Hospital
 3920 Johns Hospital

Georgetown Police Department

592 Dispatch
 656
 688 Patrol
 1720 Tac
 1752 Special Events
 784828 Animal Control
 912 Traffic
 1008

Georgetown Fire Department

48 Dispatch
 144 Fire 1
 176 Fire 2
 208 Command
 240 Rehab
 1136
 5040 EMS Link

Round Rock Police Department

1648 North Dispatch
 1680 South Dispatch
 1712 Tac 1
 1744 Information
 1776 CID 1
 1808 CID 2
 1840 Training & Stadium
 1872 Special Operations
 1904
 1936 Talk
 1968 Talk
 2832 Scene 2
 6736 Tac 3

Round Rock Fire Department

2096 Dispatch
 2128 Tac 1
 2160 Tac 2
 2192 Tac 3
 5008 EMS Link

BELL COUNTY

Bell County and its cities and towns used everything from the low band through UHF. This changed last year when everyone in the county switched to an EDACS analog TRS.

Bell County system in LCN order

1=857.2375, 2=858.2375, 3=859.2375,
 4=860.2375, 5=859.7625, 6=856.4875,
 7=857.4875, 8=858.4875, 9=859.4875,
 10=860.4875, 11=856.4625,
 12=857.4625, 13=858.4625,
 14=859.4625, 15=860.4625,
 16=856.7375, 17=858.7375,
 18=859.7375, 19=855.4875,
 20=860.7625

Bell County Sheriff's Office

02-101 Main
 02-103 Tac 1
 02-104 Tac 2
 02-105 SWAT
 02-106 CID
 02-107 Court Deputies
 02-110 Jail
 02-112 Car-to-Car
 02-115 Civil Channel
 02-116 Channel 8
 02-121
 02-122 Rural Law Enforcement
 02-123 Rural Tac 1
 02-124 Rural Tac 2

Bell County Constable

03-021 Main
 03-031 Judge's Office
 03-041 Pursuit Channel
 03-053 Car-to-Car/Bell County Fire
 04-101 VFD Dispatch
 04-102 VFD Common
 04-117 VFD Admin
 04-113 Southwest Bell County Dispatch
 04-125 Fireground 1
 04-126 Fireground 2
 04-127 Training 1
 04-130 Training 2
 15-157 Troy 460 Patch

Belton Police

02-081 Main
 02-083 Tac 1
 02-084 Tac 2
 02-085 Tac 3
 02-087 Car-to-Car
 02-091 PSO
 02-096 Admin 2
 02-097

Belton Fire

04-081 Belton FD Main

Salado Fire

04-111 Dispatch

Temple Police

02-021 Main
 02-023 Tac 1
 02-025 Tac 3
 02-026
 02-032 Car-to-Car
 02-087

Temple Fire & EMS

04-021 Dispatch
 04-022 Fire 1
 04-023 Fire 2
 04-024 Fire 3
 04-025 EMS 1
 04-026 EMS 2
 04-027 EMS 3
 04-030 HAZMAT
 04-031 Staff
 04-032 Admin
 04-033 Command
 05-001 Station 1

05-002 Station 2
 05-003 Station 3
 05-004 Station 4
 05-005 Station 5
 05-006 Station 6
 05-007 Station 7

Troy Police

02-126 Main

Troy Fire

04-115 Dispatch

Texas Department of Public Safety

02-141 Main
 02-142 County/DPS
 02-144 TABC Main
 02-146 Car-to-Car

MEDCOM

04-141 Scott & White Hosp ER
 04-142 Kings Daughter Hosp ER
 04-143 Metroplex Hospital ER
 04-144 Darnell Army Hosp ER
 04-145 MED 9
 04-146 VA Hospital ER

Emergency Operations

08-021 Bell County EOC
 08-041 Temple EOC
 08-042 Citywide Temple

Mutual Aid

04-121 Mutual Aid 1
 04-122 Mutual Aid 2
 04-123 Mutual Aid 3
 04-124 Mutual Aid 4

For more information, visit http://www.qsl.net/kc4vja/radio/tx_bell.html.

FALLS COUNTY

If you take your eyes off the road, even for a few seconds, you may miss your time in Falls County. Actually I exaggerate. I-35 runs for a couple of miles though Falls County, but there are no exits and the only county marker sign that I've seen is on the northbound frontage road which is hard to see from the interstate proper. Trust me, you do pass through here.

Falls County Sheriff's Office

Output	Input	Notes
154.740	155.790	Dispatch

Falls County Fire Department

154.370	151.475	Dispatch
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MCLENNAN COUNTY

The county seat, Waco, has its own Motorola Type II analog TRS that all city services use. The county has talkgroups on the TRS, but relies mainly on its VHF network.

McLennan County Sheriff's Office

Ch. 1 154.875
 Ch. 3 156.575
 Ch. 5 156.165

McLennan County Fire Department

154.415

Waco TRS (Motorola Type II): 856.2375, 856-

858.7625, 856-860.9375

Waco Police Department

48 Channel A Dispatch
 80 Channel B
 112 Warrants
 144 Detectives 2
 176 Detectives 1
 208 Channel F Talk
 304 Admin
 432 Tac 1
 464 Tac 2

HILL COUNTY

In Hill County, we have to decide on taking IH-35E or IH-35W. Both Dallas and Fort Worth warranted a major north-south interstate, so the powers at be created an east and west branch of IH-35 to pass through Dallas and Fort Worth respectively.

Following IH-35E will take you through Ellis and then Dallas County. IH-35W will take you through Johnson and then Tarrant County. Both branches rejoin in Denton County.

Hill County Sheriff's Office

Ch.	Output	Input	CTCSS	Notes
1	155.550	154.830	100.0	Dispatch
2	156.000	158.880		
5	154.830			Talk

Hill County Fire Department

154.295

ELLIS COUNTY**All Ellis County Law Enforcement**

Ch.	Output	Input	CTCSS	Notes
1	155.835	158.955	162.2	Dispatch
2	155.835	simplex		Talk

Ellis County Fire Association

Ch.	Output
1	46.46
2	46.38

JOHNSON COUNTY**Johnson County Sheriff's Office**

Ch.	Output	Input	Notes
1	158.745		
2	153.920	Simplex	Talk

Johnson County Fire Department

46.10

Johnson County EMS

854.2125

Burleson Police Department

1	453.100	458.100	Dispatch
2	453.275	458.275	
3	451.275	456.275	

Burleson Fire Department

453.150	458.150	Dispatch
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DALLAS COUNTY

The City and County of Dallas still rely on their tried and true VHF and UHF systems for fire and law enforcement. Carrollton's Type I system is used by cities in Dallas and Denton counties.

Dallas County Sheriff's Office

155.715	F1	Constables
155.985	F2	Jail
154.950	F3	Unit-to-Unit
155.970	F8	Unit-to-Unit

Dallas Police

460.325	F1	Central & East
460.375	F2	Northeast
460.500	F3	Southeast
460.425	F4	Southwest
460.075	F5	Northwest
460.175	F6	North
460.275	F7	Traffic
460.125	F8	Tactical
460.025	F9	Information
460.225	F10	Car-to-Car
460.475	F11	Investigators
460.400	F12	Secondary

Dallas Fire

460.575		Dispatch
154.130	F2	Ambulances
153.890	F3	Primary

Fireground

154.415	Fireground
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Carrollton TRS (1201) Motorola Type I (s0, s4, s4, s4, s0, s11, s0 s0) 856.2625, 856.7625 857.2625, 857.7625 858.2625, 858.7625 859.2625, 859.7625 860.2625, 860.7625

Carrollton Police

100-1 Channel A Dispatch
 100-2 Channel B Information
 100-3 Channel C CID
 100-4 Channel D
 100-5 Channel E Talk
 100-6 Channel F Talk
 100-7 Channel G Supv/TAC
 100-8 Channel H
 100-9 Channel I

100-10 Channel J
100-11 Channel K

Carrollton Fire/EMS

300-1 Dispatch
300-2 Tac 2
300-3 Tac 3
300-4 Tac 4
300-10 Trinity Medical Center
300-11 RHD Hospital
300-12 Bitel Medical

TARRANT COUNTY

Fort Worth maintains a mammoth trunked radio system used by the city, Tarrant County, plus many suburban municipalities in the Fort Worth area. Strictly speaking, I-35W passes through only Fort Worth and unincorporated Tarrant County, so those are the two I will focus on. An entire article could be written about trunk tracking the Dallas/Fort Worth Metroplex. For that, I direct you to Lindsay Blanton's web site <http://www.lcblanton.com/>

Fort Worth Public Safety TRS Motorola Type II Analog

866.1625, 866.2125, 866.2875, 866.3625, 866.3875, 866.6625, 866.6875, 866.7125, 866.8375, 866.8875, 867.1625, 867.2125, 867.2625, 867.3375, 867.3875, 867.6625, 867.7125, 867.7625, 867.8375, 867.8875 MHz

Tarrant County Sheriff's Office Fort Worth Police/North Division

2992 N-PTRL Patrol
3024 N-CID CID
3056 N-COPS CRO/Code Blue
6864 N-COPS2 CRO/Code Blue
3088 N-SUPV Supervisor
3120 N-FOOT Foot/Bike Patrol
3152 N-TLK1 Talk Channel 1
3184 N-TLK2 Talk Channel 2
3216 N-TLK3 Talk Channel 3

South Division

2448 S-PTRL Patrol
2480 S-CID CID
2512 S-COPS CRO/Code Blue
6896 S-COPS2 CRO/Code Blue
2544 S-SUPV Supervisor
2576 S-DIR Directed Patrol
2608 S-TLK1 Talk Channel 1
2640 S-TLK2 Talk Channel 2
2672 S-TLK3 Talk Channel 3
2960 S-K9 K9

East Division

2160 E-PTRL Patrol
2192 E-CID CID
2224 E-COPS CRO/Code Blue
6800 E-COPS2 CRO/Code Blue
2256 E-SUPV Supervisor
2288 E-TRAC TRAC

2320 E-TLK1 Talk Channel 1
2352 E-TLK2 Talk Channel 2
2384 E-TLK3 Talk Channel 3

West Division

2704 W-PTRL Patrol
2736 W-CID CID
2768 W-COPS CRO/Code Blue
6832 W-COPS2 CRO/Code Blue BLU
19024 W-COPS3 CRO/Code Blue
2800 W-SUPV Supervisor
2832 W-DIR Directed Patrol
2864 W-TLK1 Talk Channel 1
2896 W-TLK2 Talk Channel 2
2928 W-TLK3 Talk Channel 3

Central Division

3248 C-PTRL Patrol
3280 C-CID CID
3312 C-COPS CRO/Code Blue
6928 C-COPS2 CRO/Code Blue
3344 C-SUPV Supervisor
3376 C-DIR Directed Patrol
3408 C-TLK1 Talk Channel 1
3440 C-TLK2 Talk Channel 2 (Texas Motor Speedway)
3472 C-TLK3 Talk Channel 3

Fort Worth Fire

1808 FDGP-1 Fire Group-1 Dispatch
1840 FDGP-2 Fire Group-2 Major Incidents TAC
1872 FDGP-3 Fire Group-3 Grass Fires TAC
1904 FDGP-4 Fire Group-4 EMS Incidents TAC
1936 FDGP-5 Fire Group-5 TAC
1968 FDGP-6 Fire Group-6 TAC
2000 FDADMN Fire Administration
2032 FDINVT Fire Investigation
2064 FDPREV Fire Prevention - Texas Motor Speedway Operations
2096 FDCMD1 Fire Command-1
2128 FDCMD2 Fire Command-2
5200 FDCOMM1 Fire Communications - Training 1
5232 FDCOMM2 Fire Communications - Training 2
5264 FDCOMM3 Fire Communications - Training 3
5296 FDACAD1 Fire Academy - Training 1
5328 FOACAD2 Fire Academy - Training 2
5360 FDACAD3 Fire Academy - Training 3
6384 DIV1TLK Division 1 Talk
6416 DIV2TLK Division 2 Talk
6448 DIV3TLK Division 3 Talk
6480 DIV4TLK Division 4 Talk

Fort Worth EMS

5392 EMS-1 EMS - Training 1
5424 EMS-2 EMS - Training 2
5456 EMS-3 EMS - Training 3

DENTON COUNTY

As the Dallas/Fort Worth area has grown, its suburbs have spilled over into Denton County. The City and County of Denton operate two separate Motorola analog systems, the city's is type I and the county's type II. Cities in the southern part of the county are on Dallas and Tarrant county based systems.

Denton County TRS Motorola Type II Analog

856.2875, 857.2875, 858.2875, 859.2875, 860.2875

Denton County Sheriff's Office

48 Dispatch
112 Tac-1
144 Tac-2
176 Tac-3
208 Tac-4
240 Tac-5

Denton County Fire

8240 F1 Dispatch
8272 F2 Trophy Club
8304 F3 Roanoke
8336 F4 Justin
8368 F5 Argyle
8400 F6 Double Oak
8432 F7 Ponder
8464 F8 Krum
8496 F9 Sanger
8528 F10 Little Elm
8592 F11 Pilot Point
8624 F12 Mayhill & Cripple Creek

Texas Department of Public Safety

16688

City of Denton TRS

Motorola Type I Analog (s4, s4, s4, s4)
853.0625, 853.9125, 854.5625, 856.3125, 857.3125, 858.3125, 859.3125, 860.3125

Denton Police

F1
F2
F3
F4

Denton Fire

Dispatch
Tac-1
Tac-2



TEXAS DEPARTMENT OF PUBLIC SAFETY

Statewide Bandplan

Display	Transmit	Receive	PL	Code Service
1 DPS BASE	154.680	155.460	162.2	DPS MOBILE TO BASE 'A'
2 DPS MBL	155.460	155.460	162.2	DPS MOBILE TO MOBILE 'A'
3 I/C MBL	154.950	154.950	N/A	INTERAGENCY MOBILE
4 I/C BASE	154.950	155.370	N/A	INTERAGENCY BASE
5 CHL 1 RX	154.680		162.2	CHL 1 MOBILE RECEIVE
6 CHL 8 RX	154.695		162.2	CHL 8 MOBILE RECEIVE
7 DPS MBL	155.445	155.445	162.2	DPS MOBILE TO MOBILE 'B'
8 DPS BASE	154.695	155.445	162.2	DPS MOBILE TO BASE 'B'
9 MBL/MBL	159.210	159.210	162.2	DPS MOBILE TO MOBILE 'C'
10 DPS RP SW	154.665	159.210	162.2	DPS REPEATER STATEWIDE
11 DPS RP 11	154.665	159.210	107.2	DPS REPEATER 11
12 DPS RP 12	154.665	159.210	110.9	DPS REPEATER 12
13 DPS RP 13	154.665	159.210	118.8	DPS REPEATER 13
14 DPS RP 14	154.665	159.210	123.0	DPS REPEATER 14
15 DPS RP 15	154.665	159.210	127.3	DPS REPEATER 15
16 DPS RP 16	154.665	159.210	136.5	DPS REPEATER 16
17 DPS RP 17	154.665	159.210	141.3	DPS REPEATER 17
18 DPS RP 18	154.665	159.210	146.2	DPS REPEATER 18
19 DPS RP 19	154.665	159.210	151.4	DPS REPEATER 19

University of North Texas Police

100-2 Dispatch

City of Lewisville TRS

Motorola Type II Analog (s0, s0, s0, s3, s5, s12)

Lewisville Police

600-1
F1 Patrol
F2
F3 Information
F4 CID
F5 Animal Control

Lewisville Fire

600-8
Fire-1 Dispatch
Fire-2
Fire-3
Fire-4
Fire-5
Fire-6

COOKE COUNTY

Cooke County Sheriff's Office

Output Input Notes
155.130 155.970 Dispatch

Cooke County Firefighters Association

46.10

Ken Reitz, KS4ZR
ks4zr@firstva.com

Ten Meters: How to Make Your Daily Commute Fun

Most of us have to commute from home to work in what's often a dreary ritual of searching for something interesting on the radio or fumbling for cassettes or CDs in order to relieve the tedium. If you're a ham with a Technician class license you probably have 2 meters in the car and enjoy chatting with friends on a favorite repeater. After a while your thoughts might turn to something more interesting like working exotic DX stations or just rag chewing with other hams across the country. But, mention going HF mobile and most of us cringe at the thought of towering antennas on our cars with guy wires going to bumpers and hood ornaments. Then there's the expense of those fancy HF rigs which eat up most of the interior of your car.

Well, it doesn't have to be that way. There is a place where rigs and antennas are small, prices cheap and, when the band is in, the DX is hot. I'm talking about the 10 meter band, and all winter long this band is in its prime. Ten meters is like a wide open frontier. Spanning two megahertz, this band delivers the whole HF feast. Tune up and down 10 meters and you'll hear CW, RTTY, packet, SSTV, AM, FM, repeaters, QRP operators and AMSATs. What's left? Well, for starters there's net activity, DX pile-ups, beacon stations, contests, county hunters, and good old fashioned rag chewing. HF amateur radio operating doesn't get any better than this!

❖ HF on the Cheap

Years ago a number of manufacturers built all-mode transceivers designed to operate only on the ten meter band. Ranger, Uniden, and Radio Shack all came into the market with small, full-function transceivers with a power output of 25 watts. Their size, not much bigger than a mobile 2 meter rig, makes for easy under-dash installations.

Uniden no longer makes such a product (though they continue to service old ones), Radio Shack continues its production with the HTX-10 (see photo), Ranger now offers a 10 meter/12 meter transceiver combo (RCI-

2950DX), and Alinco has joined the crowd with its DR-M03SX (though it operates only in the FM mode). Radio Shack's HTX-10 is the best bargain at \$150, but used 10 meter transceivers are readily found at hamfests at about half their retail price.



Antennas for 10 meters are relatively small and inexpensive. Three-element beam antennas for ten meter base stations are small enough

to be turned by a regular TV antenna rotor. Mobile antennas for these radios are a little smaller than CB antennas and cost as little as \$30 new. So, there it is: a complete ten meter HF station for under \$200 brand new!

❖ How the Band Works

It really helps to have an understanding of how the 10 meter band works to get the most out of it. Ten meters really starts to open up during the winter months, when atmospheric conditions are at their best. Virtually all activity will happen between your local sunrise and your local sunset. This is what makes it the perfect commuter's band. The band will be most active during the peak of the current solar cycle, and, while we may have reached the peak earlier this year, there will be several more winters when the band will continue to make it worth your while to have your ham ticket.

Signals on 10 can come from anywhere, but typically you'll hear stations to the east of you in the morning and stations to the west as the day progresses. Depending on how active the ionosphere is for any given day, stations may be weak or very strong. As a commuter, if you live on the East Coast, you can expect to hear Europe and Africa during your morning commute and the

West Coast and possibly Asia on your evening commute. West Coasters will hear the East Coast during their morning commute and Asia in the evening.

At different times the Caribbean and South America may also be heard. Sometimes you'll be right in the middle between two DX stations, able to pick up British Columbia and Venezuela at the same time!

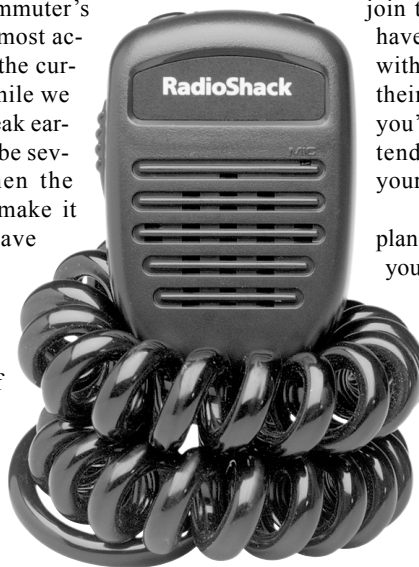
Another characteristic of 10 is that conditions may be great for hours or just minutes. I've had nice hour long chats with hams in Great Britain, but other times there's only enough time to trade call signs and signal reports. One way to determine how conditions are is to monitor the beacon stations (see chart #2). Don't be discouraged if you don't hear any beacons, the band could still be wide open. The only real way to find out is to call CQ!

❖ Operating Tips for Ten

The first thing you should do when you get your 10 meter mobile station installed is to listen. You'll learn more from hearing how others are operating than you can read in any book. If you come across a DX station working a pile-up don't immediately key up and join the fray. Most DX stations have their own way of dealing with pile-ups. Pay attention to their procedures; by doing so you'll help cut down on unintended interference and save yourself some embarrassment.

Pay attention to the band plan laid out in chart #2. Unless you are actually operating QRP (less than 5 watts on CW and less than 10 watts voice) stay off the QRP CW and SSB calling frequencies. Further, stay off the FM simplex and repeater frequencies unless you are actually operating as such. You get the idea.

The satellite downlinks are easily heard with even modest receivers. These are amateur satellites zipping over your house at about 17,000 mph. The satellite receives signals sent by hams on one band,





themselves talking with DX stations thousands of miles away. It's just one of the unpredictable things about 10 meters.

❖ One Last Thing

The FCC's license restructuring has made a lot of changes, but operating 10 meters remains essentially the same (see chart #1). Anyone with a Technician Plus license can hit the airwaves. If you have a "codeless" Tech license all you need is to pass the 5 wpm code test and you're in business. If you don't have an amateur radio license, but haven't been attracted to the 2 meter repeater crowd, ten meters might be just the excuse you need to dive in. There are plenty of local ham clubs which have regularly scheduled classes to help

2 meters in this case, and retransmits the signals on 10 meters, which is how you can hear them. Since the satellite's "footprint" (the area on Earth which can have access to the satellite) is fairly large and is moving quickly, conversations tend to be very short. Listen for the characteristic "Doppler shift" as the sound of the transmission gets higher or lower as it moves toward and away from your location.

Ten meter FM repeaters are interesting. There are a number of FM repeaters around the world which perform similar to 2 meter FM repeaters. They employ a transmit frequency offset from the receive frequency (the transceivers are set up to automatically make the offset in duplex mode). The difference is that these repeaters can be thousands of miles away. When the band opens up these repeaters sometimes become free-for-alls as hundreds of hams try to access the repeater at once. It's often not the best example of "considerate operating."

Since most of these rigs are capable of SSB, FM and AM operations, there's lots of room for experimenting locally. Once the sun goes down 10 meters becomes virtually dead. That doesn't mean the action has to stop. When skywave transmissions are impossible, groundwave propagation (transmissions which travel along the ground before dissipating) comes in to play. Groundwave is usually good only for a radius up to several miles. Still, it could be enough for a club or group of friends in the immediate area to enjoy unfettered rag chewing. However, every now and then the band will open up and the local gang may find

you get your ticket and there are excellent self-study courses available at reasonable cost as well.

I've used a Uniden 2510 into a Hustler 10 meter whip with its 25 watts out for more than ten years and have made hundreds of contacts with hams all over the world. During the winter months I actually look forward to my 40 minute trip into town! Take advantage of what 10 meters has to offer: small radios and antennas, low prices and international communications in all modes.

This year the annual ARRL 10 meter contest will take place December 9-10. Set aside those days to get acquainted with this band and find out what's in store for you! For complete contest rules see <http://www.arrl.org>.

Chart 1

License Class, Frequencies, Modes, Power Allowed

Novice & Technician Plus:

28.100-28.300 MHz; CW, RTTY/Data; 200 Watts PEP

28.300-28.500 MHz; CW, Phone; 200 Watts PEP

General, Advanced, Amateur Extra:

28.000-28.300 MHz; CW, RTTY/Data

28.300-29.700 MHz; CW, Phone, Image

Chart 2

Frequency	Mode & Notes
28.000-28.070 MHz	CW (28.060 MHz QRP CW calling frequency)
28.000-28.120 MHz	Data
28.070-28.150 MHz	RTTY
28.120-28.189 MHz	Automatically controlled data stations
28.150-28.190 MHz	CW
28.190-28.225 MHz	Beacons
28.300-29.300 MHz	Phone (28.385 MHz QRP SSB calling frequency)
28.680 MHz	Slow Scan TV
29.000-29.200 MHz	AM
29.300-29.510 MHz	Satellite Downlinks
29.520-29.580 MHz	FM Repeater Inputs (29.600 MHz FM Simplex)
29.620-29.680 MHz	FM Repeater Outputs

From the FCC Rule Book & www.arrl.org

NOTICE: It is unlawful to buy cellular-capable scanners in the United States made after 1993, or modified for cellular coverage, unless you are an authorized government agency, cellular service provider, or engineering/service company engaged in cellular technology.



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Q. How can I remove the scratches from the plastic bezel of the display on my hand-held radio? (Michael Jacquot, e-mail)

A. The best thing I've found is Brasso, available everywhere. It has a very mild abrasive used to polish soft metals. While it cannot remove deep scratches, it certainly does tone down abrasions, and brighten up the look! On very mild abrasions, I've rubbed my thumb back and forth over the surface until it gets hot; while this does nothing for your thumb, it does seem to soften and blend the marring!

Q. This past weekend I was showing my shortwave antenna to a friend. He told me that I needed to shorten the coax lead-in to match the antenna, the way he did with CB radios in the 70s. Is this true? (Chris Campbell, Columbus, OH)

A. No, it's not. While there may be a tiny reduction in resistive loss if you shorten the coax lead-in, you won't be able to hear it. The myth about specific lengths of coax comes from measuring standing wave ratio; but if you place an SWR meter between a transmitter and the coax, all you will measure is the impedance match at that junction, not at the antenna feed point—unless the coax is an electrical half-wavelength (or whole-number multiple of a half-wavelength) at the frequency on which you are operating (such as CB at 27 MHz). Since that occurs only at prescribed frequencies, it's meaningless for general shortwave listening.

Antennas seem to carry more mythology than Greek history. If there's one true axiom about shortwave receiving antennas, it's this: Almost anything will work! Modern receivers are very sensitive, so they don't need big antennas. And since the frequency ranges are so broad, there is no advantage to cutting specific wire lengths. More important considerations for shortwave wire antennas are:

- (1) Elevate them as high as practical;
- (2) Choose a length between roughly 30 and 70 feet;
- (3) Keep them away from the dwelling and from electrical power lines;
- (4) Feed them with quality coax at or near the center.

Well-made coax with properly installed connectors include RG-8/U, RG-58/U, RG-6/U, RG-59/U, or nearly any other kind of coax except very small RG-174/U for shortwave reception. The important parameters are shielding and low loss, not impedance.

But even if a shortwave antenna system is somewhat lossy, it won't make much difference—the signal and the background noise will both be proportionately reduced, so all you would need to do would be turn up the volume control slightly to hear it as if it were stronger!

Q. I have an old Hunterdon aeronautical frequency directory that shows Sky Harbor Airport (Phoenix) using 140.000 MHz. Is this a valid frequency? If I tune that frequency on an inexpensive multiband radio that has a continuous 108-174 MHz band, am I likely to hear it? (Robert Brock, Phoenix, AZ).

A. Although Hunterdon is no longer publishing their directories, the frequency 140.000 MHz is still a valid Air National Guard frequency for their Sky Harbor operations. If you are close enough to the base, inexpensive multiband radios are capable of detecting both AM and FM transmissions simultaneously on their VHF ranges.

Q. With the prohibitions against making modifications to cellular-restorable scanners, how do I know what modifications are legal to my scanner or shortwave receiver? (Numerous inquiries)

A. Many hobbyists are concerned about the vague term "modification." Just what can you do to a scanner (or other FCC-certified receiving equipment) without breaking the law?

This is specifically addressed in the Code of Federal Regulations, CFR-47, part 2.1043, which allows any mechanical or electrical modification which does not affect the characteristics which were originally filed with the Federal Communications Commission for certification.

Simply stated, the owner may exchange IF filters, replace line cords, alter audio

stages, customize cabinet hardware, add S meters, and do anything else that does not affect the frequency determining circuitry or cause an increase in incidental radio frequency (RF) radiation which could interfere with other electronics.

Q. Is it simple to add a signal strength meter (S meter) to a scanner or other receiver? (Tim Taylor, Erie, PA)

A. While it is relatively straightforward, it is a custom installation in every model. Basically, an S-meter circuit consists of a sensitive current meter (microammeter or milliammeter) in a DC amplifier circuit, designed to detect subtle changes in current and registering those as a deflection of the meter needle.

The circuit is most usually added to the automatic gain control (AGC) portion if the intermediate frequency (IF) stages where the difference in signal levels is the most pronounced. The problem is that different integrated circuits (ICs) are used for different models.

Further complicating the effort is that many designs use different chips, or different sections of the same chip, for AM and FM detection; therefore, the S meter might work only on one mode unless switched to the other circuit for the other mode. If you can find an AGC line common to both modes, you're in luck!

But for the stalwart experimenter, such components are available. Grove Enterprises is currently selling an excellent S-meter for only \$5.95 for home-brew projects and entrepreneurs who want to offer an S-meter add-on service. For more information, visit that Web page at <http://www.grove-ent.com/ttsmeter.html>.

Questions or tips sent to "Ask Bob," c/o MT are printed in this column as space permits. If you desire a prompt, personal reply, mail your questions along with a self-addressed stamped envelope (no telephone calls, please) in care of MT, or e-mail to bgrove@grove-ent.com. (Please include your name and address.) The current "Ask Bob" is now online at our WWW site: www.grove-ent.com

Gary Webbenhurst
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This month's column continues a list of bright ideas for you to pass on to your family members, who always ask, "What do you want for a holiday gift?" These gift ideas are more modest in price compared to last month's suggestions.

75

A nice stocking stuffer would be a magazine subscription (or renewal.) Naturally, *Monitoring Times* is at the top of my list. Only \$26 a year. Call 1-800-438-8155. *MT* is also available online in PDF format for only \$20 (or \$11 if added to your printed subscription.) My other candidate is *Popular Communications* (\$26 a year) at 1-516-681-2926.

76

For \$5.00, you can order a really neat wall charter of the U. S. radio spectrum as assigned by international agreements. Log on to: <http://bookstore.gpo.gov/sb-sb-296.html> (There are several other interesting publications on the same web site.) This chart is huge! I hope you have a large wall space and an understanding spouse. It is also an inexpensive gift to buy for a radio buddy.

77

If you don't have one, a beginner's soldering tool set. You never know when you might need to solder a new coax connector or repair a broken BNC. Under \$20. Already have a soldering iron? Then how about the workbench holder and tip cleaner. Need some soldering experience? Radio Shack (RS) has several RSU kits for under \$15.

78

A universal battery charger from Maha. Check'em out at 1-800-376-9992, or <http://www.maha-comm.com/>.

79

DC (RS#273-1815) and AC (273-1662) power adapters. I always carry these in my "Go" fanny pack. With these, I can run virtually any electrical device from an AC outlet or the car's cigarette outlet.

80

An assortment of DC wire connectors. You also need a quality wirestripper. The RS one is not up to my specs. You can try an auto supply store, Wal-Mart, or K-mart, or Graybar. They carry the very best, but quite steep prices. Nevertheless, a quick field trip to Graybar might unearth other "must have" tools.

81

Keep in the habit of checking bargain internet locations. There are often big savings at <http://www.uniden.com/docs/store/itemlist.cfm?cattype=prd> such as the BC144XL 16 channel base scanner for \$36, and the BC148XLT-1 20 channel base scanner for \$53, and the BC60XLT handheld scanner for \$48.36 In stock like new. Another great source is Grove enterprises at <http://www.grove-ent.com/clearance.html>.

Inventory changes daily so keep that on your Internet links bar. Also check the Bargain Bin at <http://www.grove-ent.com/hmpgbbb.html>. Another source is <http://www.strongsignals.net/hbm/bargains.htm>.



Naturally I had to try on my new vest to see if it fit!

82

A regional Frequency Guide. Yes, I know RS carries them. But there are many other guides that are published by individuals or clubs. Contact your closest Scanner/Ham/2-way radio dealers. Try the Internet at <http://www.albany.net/~scanner/sw/vx/32wb.htm>. Others to check out: <http://www.aosc.org/info.html>, <http://www.scannermaster.com/prod01.htm>, or <http://www.bearcat1.com/menu03.htm>. In Canada, RS carries special Canadian frequency guides.

83

A common complaint of scanner owners is the lack of brightness

on the display backlight. Here are two possible solutions. Bookstores, and yes Radio Shack, sell book lamps that focus light in one direction. These run off batteries and can be switched on or off very quickly. I prefer the clamshell ones. All the light is focused at the radio and not in my eyes. I also experimented with the small square night-lights meant to plug directly into the wall outlet. Except I use a cheap extension cord. You can position this light at an angle, which softly illuminates the room, but again not in your eyes. I am sure there are many other lighting ideas out there. Do you have an idea that worked for your situation?

84

A multi (volt) meter. Watch your sales and these can be had for less than \$20. If you are not familiar with their many uses, you can buy a companion book.

85

Tip: New Year's Eve is always buzzing with police, fire and EMS traffic. If you are out on the town, you can use a recorder. New Year's day is dead unless you live in a community that is hosting a parade or bowl game. Yeah, I know, I should get a life. Frankly, I am getting too old to party after midnight. I would rather wake up the next day and watch football.

My disclosure: I have no stock or other business interests in Radio Shack. Many of my suggested products can be found at many other sources. Nevertheless, there is no getting around the fact that there is a Radio Shack store within a 20 minute drive of 90% of the population. There are many discount stores, electrical supply and auto parts stores that have interesting items. Just take your time and carefully wander up and down EVERY aisle.

Graybar is another very interesting store. The prices are steep but their tools and parts are top grade. There are also small used computer and other "surplus junk" type stores hiding in the small strip malls and converted barns. Here in Spokane, I have discovered the "General Store" and the "White Elephant." Just gawking at the merchandise is a treat. Occasionally, I find a product with a new potential use.

I enjoy the privilege of writing this column. I hope you have found at least a few of my ideas helpful. I am always happy to hear from you, the faithful readers of *MT*.

Happy Holidays! I look forward to an excellent New Year in 2001.



Sunshine State not so Sunny

The State of Florida recently awarded the contract for their statewide radio system to Com-Net Ericsson. A press release, dated June 28th, reads:

"The State of Florida Joint Task Force has awarded the Florida Statewide Radio Communications Project to Com-Net Ericsson Critical Radio Systems, Inc. of Lynchburg, VA. Com-Net Ericsson is pleased to join with the State to create the first-of-its-kind, public-private partnership for critical communications. The system, to be owned and operated by Com-Net Ericsson, will provide communications for state agencies. The implementation of this project will result in immediate cost savings, insulate the State from future cost overruns and will allow the state agencies to focus on their core competence of protecting and serving the citizens of Florida."

Motorola, which for years had been building and running the digital system, is fighting the move. In a press release (the full text of which can found on the Motorola web site at www.mot.com/LMPS/pressreleases/page1201.htm), there are some stunning comments that make you wonder about the process of radio procurement, not just in Florida, but around the country.

TALLAHASSEE, Fla. (Sept. 28, 2000) - Following a long and disputed procurement process for the completion of a statewide law enforcement radio system, the State of Florida Department of Management Services (DMS) today contracted with Com-Net Ericsson Critical Radio Systems, Inc.

Today's contract means that Phases I and II of the statewide system - successfully installed and recently upgraded by Motorola - will be completely dismantled and rebuilt. The Florida DMS contract award to Com-Net also covers the completion of Phases III, IV, and V. In response to the Florida DMS contract award to Com-Net Ericsson, Motorola's position is as follows:

We are disappointed that the State of Florida has chosen to sign a contract with Com-Net, the

terms and services of which indicate the contract is not in the best interests of Florida, its residents and its visitors. The timing of today's contract signing is equally surprising and inappropriate, since there are currently several legal actions pending that seriously challenge the legal process followed by DMS in the procurement process, including alleged violations of the Florida Sunshine Law.

The statewide law enforcement radio system provides a critical communication link for public safety officers in state organizations such as the Florida Highway Patrol, Florida Department of Law Enforcement (FDLE), Fish and Wildlife Conservation Commission and others. Once completed, the system is designed to allow officers to communicate instantly and seamlessly across the entire state. As well, the system provides a direct communication link between state law enforcement and city and county law enforcement agencies. The system's design, reliability and ease of use are critical in officer arrest situations and directly affect the safety and well being of the public.

Although the State had a well-defined evaluation process in place to safeguard those functions, the appointed evaluation committee made serious deviations from that specified process. These inappropriate actions resulted in a contract that does not meet many RFP specifications and eliminates many user functions that are critical to the safety of Florida's law enforcement community. (See the listed web page for further details of the press release.)

What this means for the future of this system, used by Florida Highway Patrol among other state agencies, is unclear. Being a digital system, scanner users were never that fond of it anyway.

❖ More on Digital

The State of Michigan has, probably, the most extensive digital statewide network in the nation. The system has been up and running for a number of years and continues to grow. Here's a report from Ron Wilbanks on some recent changes:

Recently, with the expansion of the Michigan State Police TRS (trunked radio system) into Districts 5 and 6, a few counties have decided to move their E-9-1-1 dispatching over to the Michigan State Police Trunked Radio System.

Barrien
Ingham
Livingston
Lake
Mason
Oceana
Capitol Airport Authority [police and fire] (Clinton County)
Huron Township Police (Wayne County)
Lansing City Police and Fire (Ingham County)

County 9-1-1 Central Dispatches expected to join the system in 2001 are:

Barry
Genesee
Ionia
Jackson
Kent
Macomb
Manistee
Montcalm
Ottawa
St. Clair
City of Grand Rapids and Kentwood Police (Kent County)

Obviously, the above list of participants is subject to change. You may read more about the MSP TRS at: <http://www.mpscs.com/index.html>.

❖ Trunking Updates

We recently received the following contribution for West Hartford, Connecticut. Connecticut is another state that is installing a statewide digital radio system. So far the reports on this system have been very positive. Other state digital systems in development include Ohio (the MARCS system), Kentucky and Colorado. (We understand all these statewide systems to be APCO-25 compliant.)

❖ West Hartford Trunked System

Frequencies and Talkgroup IDs

866.075, 866.3250, 866.800, 868.2875, 868.8125

I found West Hartford runs with a Type 1 Motorola System (*but it appears public safety use Type II groups – editor*). I have the Radio Shack Pro 92. The Fleet map I use is 10 which is S0, S0, S0, S0, S4, S4 and I received the groups with no problems.

Talk Groups	ID
Town Wide Routine	13616
Town Wide Emergency	15216
Town Agencies Common	8848
Town Agencies All Talk	8816
Police Dispatch	240
Police Patrol 1	80
Police Patrol 2	112
Police Tactical 1	144
Police Tactical 2	176
Police All Talk	16
Police Supervisors	48
Police Investigators	208
Fire Dispatch	2640
Fire Ground 2	2480
Fire Ground 3	2512
Fire Ground 4	2544

Fire Ground 5	2576
FMO	2608
Intercity Crosspatch	2448
Fire All Talk	2416
Public Works Dispatch	4144
Public Works Ops 1	4080
Public Works Ops 2	4112
Public Works Supervisors	4048
Public Works All Talk	4016
Plants & Facilities All Talk	7216
Plants & Facilities Admin	7248
Plants & Facilities Element	7280
Plants & Facilities Mid/High	7312
Plants & Facilities Common	7344
Leisure Services All Talk	5616
Leisure Services Admin	5648
Leisure Services Operations	5680
Leisure Services Common	5712
Board of Ed All Talk	10416
Board of Ed Transportation	10448

A region from which we receive little or no information is Puerto Rico, yet below you'll find details on the Commonwealth's extensive Motorola trunked radio system:

❖ Commonwealth of Puerto Rico Police

Frequencies: 856.2625, 856.7375, 856.9375, 857.2625, 857.7375, 857.9375, 858.2625,

858.7375, 858.9375, 859.2625, 859.7375, 859.9375, 860.2625, 860.7375, 860.9375

Talkgroups:

48	SJ3 - Rio Piedras, Caimito, Monte Hatillo
112	SJ2 - Hato Rey, Puerto Nuevo
176	SJ1 - S.J., Santurce, C. Loiza, Bo Obrero
240	H1 - San Juan message channel
400	Car 1-Carolina North,South;Trujillo Alto N,S
432	Car 2-Vistamar, Los Angeles, Airport, Isla Verde
464	Car 3-Carolina East, Canovanas, Loiza, Rio Gr.
496	Satuvation Carolina
656	HN Carolina message channel
912	Caguas I, includes Gurabo
944	Caguas II, Caguas, Aguas Buenas
1808	Special assignments
39312	Radio Engineers

❖ Bearcat 780 Update – Part 2

Recently, in a telephone conversation with MT's Larry Van Horne, he told me that the forthcoming release of the Bearcat 780 was creating more scanner buzz than he had seen in a very long time. We're not surprised considering the

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feature-set of the base/mobile radio.

Last month we covered the basic features and functions of the radio along with a detailed report on its powerful Ericsson-tracking capabilities. This month we'll cover other important, non-trunking, aspects of the radio. Next month we'll try to cover Motorola tracking.

SAME Weather Alert

In addition to the standard weather scan and weather alert feature of many scanners, the 780, like the PRO-92 and PRO-2067 scanners, has a SAME weather alert feature. You can go into the Weather menu and set what are known as FIPS area codes for your area. This will open the squelch on the scanner when a warning (such as a severe thunderstorm warning) applies just to your county, for example. The display on the scanner will actually show the warning in alpha-numeric text and the NOAA siren will sound. You cannot scan and monitor for SAME alerts at the same time, however.

Reverse

You can "reverse" to the input side of most repeater communications (or you can reverse to the output if you start on the input) with the 780 by pressing the Decimal key on the scanner. This function is active in Scan, Search and Service Search modes, but not active when trunking. This applies to any signal that has a standard repeater-pair (such as 453.350/458.350) or any Ham frequency with a standard repeater pair (10-meter, 6-meter, 2-meter, 220 MHz and 440 MHz).

This feature is available on many Ham rigs but we believe this is the first time it is available on a scanner. The primary purposes for this feature is to help you check your proximity to the source of the transmitting unit and it is also helpful in testing antennas, reception range, etc.

Screen Mask

Many public safety and communications officials were contacted during the development of the BC780XLT for their opinions on features they would find appealing. Screen Mask was suggested by a law enforcement officer in the Chicago area. He commented that police officers are swamped with information-overload in their cruisers. Some departments have two or three transceivers in their patrol cars for local and intercity operations, plus mobile data terminals and controls for lights, siren and a radar gun. Add a scanner and it gets difficult, if not impossible, to keep track of it all.

Mobile scanners with alpha tags, such as the 780 and the PRO-2067 are good start. This is a big step up for officers who used to have an old Bearcat 560 (or equivalent) with their two-character channel code (01 through 16) which often left them completely in the dark as to whom they were listening. Officers with the very popular Bearcat 760 (now out of production) at least can see the frequency, but how many of them actually know that 155.730 is Podunk Police?

While the 780 and 2067 resolve this problem (the 780 has a 16-character alpha-numeric channel tag line and the 2067 has a 12-character line), the 780 takes it one step further. With the Screen Mask feature you can eliminate much of the display clutter which, for sensory-overloaded police officers or even some radio hobbyists, is unnecessary and confusing. The 780 allows you to mask the middle of the screen, which includes frequency, sub-audible tone, signal strength meter, trunking repeater activity indicators, and more. As the 780 has two large alpha-numeric text lines (one for channel or talkgroup tags and one for bank or scan list tags), the display could simply show (if you decide not to set a bank tag), for example:

Dallas Police F2

A few small icons, indicating banks and scan/manual condition, will also appear. This will make the radio much friendlier in a public safety vehicle or dispatch center environment. Note that you can also quickly restore all screen indicators by pressing the VFO knob.

Mute

One 780 feature was actually suggested by a past president of APCO (Association of Public Safety Communications Officials). He had a problem where, in the very noisy environment of a responding fire apparatus, he needed to be able to quickly quiet a scanner so as not to miss an important communication over his regular two-way channel. He didn't like turning down the volume on his 760 as he would invariably forget that he had done so. Thus, on the 780, Uniden included a Mute key (shared with the Select key which is used during Menu operations). By pressing the Select/Mute key, the audio will be muted and the display will clearly show MUTE until you press the same key again.

Service Search

The Bearcat 780 has the most extensive Service Search ever built into a scanner. While some hobbyists have never made great use of this feature, the 780's unique service search will, we believe, prove invaluable. Service Search is activated by pressing and holding the Search key (when out of trunk mode). Once you press it, you are given a menu of 10 different searches to choose from as follows. (As discussed last month, the 780 is Menu driven for many of its functions.)

1. PUBLIC SAFETY

The FCC has reclassified the Part-90 spectrum essentially into two categories of interest: public safety and business. Now just about any public safety agency can grab a frequency that formerly had been allotted specifically for fire, or police, for their own use. This is why this broad category was included in the 780 as opposed to just police or just fire. Note that all of the new reformed VHF 7.5 kHz frequencies are included in this search.

2. NEWS

A scan of the news media frequencies.

3. TV AUDIO

Listen to the audio portion of television channels 2 through 20 with this Service Search. The alpha display shows you the channel number.

4. HAM RADIO

The Ham scan covers 10-meter channels (29-30 MHz), 6-Meter (52-54 MHz), 2-Meter (145-148 MHz), 220 MHz and 440 MHz repeater frequencies. The reverse key, covered above, allows you to quickly reverse to the input side of received repeaters.

5. MARINE

This is a generic scan of the marine and coast guard frequencies, as well as the marine operator channels, in the 156-161 MHz range. Unique to this scan, however, is that whenever a channel is active during the scan, the top alpha line will display the marine channel number, i.e. Channel 16, along with the frequency on the third line of the display.

6. RAILROAD

A scan of all the Association of American Railroad radio frequencies (160-162 MHz band and the few UHF channels) along with their channel numbers (see above.)

7. AIR

An air-band scan that runs from 118.000 to 137.000 in 25 kHz increments. So many other scanners start at 108 MHz (108-118 is primarily for beacons, not voice traffic) and also scan in 12.5 kHz steps that are rarely, if ever, in used in the United States. The 780's scan rate through this "culled" air-band spectrum is extremely rapid.

8. CB RADIO

A scan of the 40 CB AM channels in the 26-27 MHz range which includes a display of the CB channel number.

9. FRS

A scan of the 14 FRS (Family Radio Service) channels in the 462/467 MHz band which includes a display of the FRS channel number. FRS radios are so widely used nowadays in neighborhoods, on the highway, and just about everywhere else that this scan should really come in handy.

10. SPECIAL

This is certainly the most interesting of all the service searches. When you activate this search, your radio rapidly steps you through all the frequencies designated for use as low-power, itinerant, wireless microphone, FRS, GMRS, new 151 MHz "CB", and "color-dot," as well as all the UHF splinter frequencies (such as 469.2625). We can hardly imagine a better method to discover new and unlicensed operations at malls, fairs, sporting events, concerts, airports, office and apartment complexes, restaurant drive-throughs, construction sites, and the like.

As usual, any of the frequencies received during a Service Search can be programmed into regular channel memory. Service Search also contains 100 "skip" frequencies which you can use to lock out unmodulated carriers, etc.

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The Guide to MUF Surfing

MUF stands for “Maximum Usable Frequency.” It’s one of the least-understood concepts in radio, because it’s too easy to think of it as an absolute. It’s actually a dynamic measurement of a highly turbulent region of our ionosphere. At any given time, there’s a different MUF for every single radio path in the world.

Furthermore, this real-time MUF will differ greatly from the predicted one, which is statistical for the whole period. As they used to say in car advertising, your mileage will vary. Some daily MUFs will go higher, some lower.

Why do we need to know any of this? Only because we are in the best month of the best year of the current solar cycle. Computers are spitting out predicted MUFs which look like software errors, but they’re not. Barring a sustained magnetic storm, the probabilities guarantee some daily observations considerably beating these.

For example, as I write this around noon in late September, the MUF for certain paths into California shows as 39 megahertz (MHz) on the Internet map at <http://www.spacew.com/www/realtime.html>. Most shortwave (HF) receivers don’t even go this high. Right now, there has to be a rural cop somewhere in the US who’s hearing Spanish on his police radio, and wondering what the heck is going on. On the job, “skip” is interference. At home, though, it’s a hobby.

❖ MUF Signal Weirdness

Interesting things happen when the real-time MUF is hanging around 30 MHz. Combine the low noise floor with the extreme efficiency of near-MUF paths, and the result often appears to defy the laws of physics. Mobile radios, even 1-watt walkie-talkies, become DX machines with near-global coverage.

In radio jargon, it’s a long “skip zone.” The ionosphere doing the work in this case is as high above the ground as it ever gets, and a single “hop” can exceed 3000 kilometers, or around 1900 miles. The usual multipath or scatter effects are not present, meaning the skip zone is just that – a zone skipped over by the signals. This guarantees that the longest paths open first.

Local transmitters usually contend with objects on the ground, but skip comes down,

unobstructed, from the sky. The result often borders on scary. One minute, you’re listening to local cops or CB chatter. The next, you’re listening to another continent, often loud enough to capture the channel. Stations pop in and out from one second to the next, sometimes in the middle of conversations.

Unless you’ve done this before, the signals will astonish you. A distant station which has always sounded terrible on 8 or 13 MHz will suddenly sound local on 26. For example, I just logged WCC, Globe Wireless, banging into Los Angeles on 26143 kilohertz (kHz). I can’t hear Globe’s California stations around there at all, though they’re burning the lower bands. Their east coast transmitter, however, sounds like next door.

❖ Surfing the MUF

Most of the time, hard-core utility types are more into acquiring the content of transmissions than just filling up the DX log. For a lot of people, this changes during a solar peak when all the freak skip is too good to ignore. Some primal, romance-of-radio feeling kicks in, and it’s 1921 again.

Experienced listeners know how to surf the MUF, greatly increasing their chances for some gosh-wow receptions. It’s a bit like catching tigers. One has to think like the tiger. Understanding the process makes it more likely to be on the right frequency when that one rare station pops in for two minutes.

For example, real-time MUF follows the sun. Look eastward in the morning, and westward in the afternoon. Of course, the trans-equatorial paths are often in all day.

MUF rises rapidly in the morning, local time, and drops off after dusk. The US usually has a very dynamic period around 1800 – 2000 coordinated universal time (UTC), when both coasts come out of the skip zone. People in California hear paging transmitters in eastern Canada, and New York hears “Long Rifle” training US Marines in California.

As the MUF rises further above the frequency being monitored, this frequency’s skip zone shrinks. Closer stations become audible. In the US, one will start to hear the middle of the country, with lots of distinctive Texas and Louisiana accents. Backscat-

ter radar used in the “war on drugs” also follows some of these MUFs, so its distinctive buzz will be around a lot.

These various signs tell the experienced surfer when to try for a certain region, or when to anticipate a higher MUF. Be warned that solar activity is currently so high that following the MUF all the way up will require a wideband radio or a scanner, and many signals will be in frequency modulation (FM). US military and police in the 40-45 MHz region should occasionally be audible, and the amateur band above 50 MHz may open for brief periods.

Here’s a loose table of allocations at the high end of HF. Everything up there gets pretty loose anyway, and overlapping is common.

❖ What You’ll Hear at the Top

Range (kHz)	Allocation or Use
24990-25010	Standard frequency and time stations
25010-25070	Fixed/mobile (25020-25060 US industrial)
25070-25210	Maritime mobile (ship simplex/duplex)
25210-25550	Fixed/mobile (25120-25320 US industrial; 25210-25330 US land mobile)
25550-25670	Radio astronomy
25670-26100	Broadcasting
26100-26175	Maritime mobile (shore)
26175-27500	Fixed/mobile
26960-27280	Industrial, scientific, medical (271200 +/- 160 kHz)
26965-27410	US Citizen’s Band (CB) (Other countries vary)
27405-28405	“Freeband,” unlicensed sidebanders
27410-28000	Fixed, mobile, meteorological aids
28000-29700	Amateur
28200-28350	Amateur propagation beacons
29550-29700	Amateur FM and repeaters
29700-29900	US land mobile (industrial)
29800-29890	US fixed (29810-29880 aero fixed)
29890-29910	US government fixed
29910-30000	US fixed (29920-29990 aero fixed)
30000-30560	Fixed/mobile - US government
30560-32000	US land mobile (industrial/land transportation/public safety)
32000-33000	Fixed/mobile - US government



Hugh Stegman

Abbreviations used in this column

AFB	Air Force Base
ALE	Automatic Link Establishment
AM	Amplitude Modulation
ARQ	Automatic Repeat Request teleprinting system
AWACS	Airborne Warning And Control System
CAMSLANT	Coast Guard Area Master Station, Atlantic
CIA	Central Intelligence Agency
CIS	Commonwealth of Independent States
DoD	US Department of Defense
EAM	Emergency Action Message
FAX	Radiofacsimile
FEC	Forward Error Correction teleprinting system
GANTSEC	Greater Antilles Section
GHFS	Global High Frequency System
ID	Identifier/Identification
JSTARS	Joint Surveillance Target Attack Radar System
LDOC	Long Distance Operational Control
MARS	Military Affiliate Radio System
MFA	Ministry of Foreign Affairs
MWARA	Major World Air Route Area
NATO	North Atlantic Treaty Organization
Ops	Operations
Pactor	Packet Teleprinting Over Radio
PAT	Priority Air Transport
PR	Puerto Rico
RSA	Republic of South Africa
RTTY	Radio Teletype
SAM	Special Air Mission
SITOR	Simplex Teleprinting Over Radio
STS	Space Transportation System ("Space Shuttle")
UHF	Ultra High Frequency
UK	United Kingdom
Unid	Unidentified
US	United States
USS	United States Ship
VIP	Very Important Person
VOLMET	Aviation Weather observations

All transmissions are USB (upper sideband) unless otherwise indicated. All frequencies are in kHz (kilohertz) and all times are UTC (Coordinated Universal Time). "Numbers" stations (encrypted, usually unidentified, broadcasts thought to be intelligence-related) are identified in () with their ENIGMA station designators, as issued by the European Numbers Intelligence Gathering and Monitoring Association.

- 2598.0 VCP-Canadian Coast Guard, Placentia Bay, with information bulletins at 0737. (MADX-MD)
- 2670.0 NMF2-US Coast Guard Group Woods Hole, with information bulletin at 1010. (MADX-MD)
- 2749.0 VCO-Canadian Coast Guard, transmitter at Charlottetown, information bulletins at 0740. (MADX-MD)
- 3456.0 Unid-Unauthorized station, probably on a sea-going tug, leaving New York for a cargo dump at an undisclosed location, using typically nasty language, at 0340. (Ron Perron-MD)
- 4014.0 ZSJ-South African Navy, Silvermine, with clear weather chart in 120/576 FAX at 0500. (Bob Hall-RSA)
- 4271.0 CFH-Canadian Forces, Halifax, NS, with a 120/576 weather chart FAX at 0512. (Hall-RSA)
- 4317.0 CAMSLANT Chesapeake-US Coast Guard, VA, with storm warnings at 2337. (Gary Neal-TX)
- 4369.0 WLO-Mobile Radio, AL, with information broadcast at 1105. (Jay Steimel-AR)
- 4372.0 "O-D-G"-US Navy, setting up a link-11 tracking net, told all players to use data frequency "Cowboy," unknown, at 2151. (Perron-MD)
- 4461.0 Cuban "Atencion" station (V2), Spanish female AM "numbers," very strong, Sunday at 0544. (Steimel-AR)
- 4717.0 "Coast Guard P-7-P"-US Coast Guard, possible law enforcement mission, in radio check with Group Key West, at 0135. (Perron-MD)
- 5598.0 Santa Maria-MWARA North Atlantic-A net, getting position from EGY 1127, an Egyptian Air Force C-130, at 0044. (Perron-MD)

- 5696.0 CAMSLANT Chesapeake-US Coast Guard, VA, working 8 aircraft searching for a downed Cuban plane with persons in the water, at 1554. CAMSLANT telling Rescue 2139 to contact Group Key West on two numbered frequencies, and VHF channel 23 (157.150) at 1607. X-1-R, telling Rescue 2139 where to drop buoys, at 1637. (Steimel-AR) *[The Cubans, who had ditched a small airplane while fleeing the country, were ultimately rescued by a freighter. -Hugh]*
- 6449.7 PWX33-Brazilian Navy, Rio, with RTTY (850/75) weather forecasts at 0610. (Hall-RSA)
- 6586.0 Corso 73-Puerto Rico Air National Guard C-130E, giving position to New York at 1920. (AI Stern-FL)
- 6628.0 Reach 5WM-US Air Mobility Command asking Santa Maria control for a descent to join Reach 856T on alternate refueling track Phoenix Banner Bravo, in a possible US Presidential support mission, at 0248. New York-North Atlantic MWARA, taking position from NRN 384, a Netherlands Navy P-3C, at 0214. (Perron-MD)
- 6640.0 Unid-Female passing military-sounding messages in Spanish, mentioned an aerial reconnaissance group and station "YV3EPI" *[Venezuelan amateur callsign? -Hugh]*, at 0301. (Perron-MD)
- 6683.0 Andrews-US Air Force, Andrews AFB, MD, working SAM 375, a Distinguished Visitor flight enroute to Andy, at 0100. (Perron-MD)
- 6694.0 Canadian UN7E-Canadian Forces, patching Rescue Coordination Center via Halifax Military, beginning flare and smoke drop training at 0150. Halifax Military working Canadian Rescue 328, a C-130, and "XXXX," possibly a P-3 aircraft, at 2226 and 2247. (Perron-MD)
- 6724.0 King 1-US Air Force C-130, working DoD Cape Canaveral, USS *Underwood*, and King 2-3, in STS-106 space shuttle countdown, at 1202. (Stern-FL)
- 6739.0 Offutt-US Air Force Global HF System, Offutt AFB, NE, reading a 30-character EAM with a figure "9" in the 25th character, which messed up the operator because nines never appear in EAMs. Perhaps this was why the op ID'd himself as Andrews, and had to correct it to "Offutt," at 0411. (Jeff Haverlah-TX) *[Offutt, McClellan, and Salinas GHFS were all IDing as "Andrews," the control point, until September, when they changed procedure, causing operators to make a lot of these goofs. -Hugh]*
- 6815.6 GANTSEC-US Coast Guard Greater Antilles Section, PR, working aircraft CG 2134, who is tracking a target off Puerto Rico, at 2248. (Perron-MD)
- 7508.4 ZSJ-South African Navy, Silvermine, with four FAX weather charts, parallel on 18238.4, at 1210. (Hall-RSA)
- 7725.0 Cuban "Atencion" station (V2), Spanish female AM "numbers," Sunday at 0544. (Steimel-AR)
- 7832.5 AFA1DA-US Air Force MARS, NJ, working AFA2DB, Georgia, in Sitor-B at 1423. (MADX-MD)
- 8122.0 Canberra Control-Australian Navy, working vessel "A-5-Q," at 1056. (Perron-MD)
- 8303.0 LOR-Argentina Navy, Puerto Belgrano, with coastal weather in RTTY (170/75), at 0614. (Hall-RSA)
- 8335.0 DRDI-German Navy submarine, working DHJ59, the headquarters at Wilhelmshaven, voice and RTTY at 2220. (Perron-MD)
- 8636.0 Cuban "Atencion" station (V2), Spanish female AM "numbers," Sunday at 2200. (Steimel-AR)
- 8706.0 Unid-Fishing boat operator off California, using AM to worry about San Pedro fuel prices to a USB station, common unauthorized frequency for these guys, at 1713. (Hugh Stegman-CA)
- 8828.0 Tokyo VOLMET, clearing after Pacific aviation weather broadcasts, at 0944 and 1114. (Steimel-AR)
- 8835.0 Unid-Unauthorized ship station, US-accented speaker grumbling to an Australian-accented male about Customs hassles,

- at 2146. (Perron-MD)
- 8855.0 Piarco Radio-MWARA South America-2 net, working Shark 44, US military, handed him off to San Juan on UHF, at 0024. (Perron-MD)
- 8906.0 New York-MWARA North Atlantic-A net, working HLA 873, who had departed Galeao, Brazil and was requesting relay to Heavy Lift Air Operations. For some reason New York then signed off in Russian, at 2350. (Perron-MD)
- 8974.0 Air Force Sydney-Australian Air Force, working an aircraft with a partial callsign of "378," at 1037. (Perron-MD)
- 8992.0 Salinas-US Air Force Salinas Global, PR, first time anyone ever reported this ID as it used to go by "Andrews" (the control point), with a test count at 0352. (Haverlah-TX) *[Jeff wins the award for the first Salinas ID reported to this column. -Hugh]*
- Navy 496-US Navy P-3, with a patch to Jacksonville duty office via Andrews, at 0638. Chalice Foxtrot-US Air Force AWACS, with a patch via Cape Radio to Raymond 24 (Tinker AFB) with a "database problem," at 1530. PAT 139-US Army Priority Air Transport, enroute to Hawaii with a brake problem, getting advice in a patch via Hickam Global, at 1540. (Stern-FL)
- 9141.5 RDU-Alabama National Guard unit, with ALE call to MGM, Montgomery, at 1300. (MADX-MD)
- 9143.5 JUE-ALE identifier of unknown station calling FOE, at 1238. (MADX-MD)
- 10033.0 Gemini 4602-Gemini Air Cargo flight over Mexico, working Miami LDOC, given frequency 6637.0, another LDOC, for a patch at 1005. (Steimel-AR)
- 10096.0 Reach 815T-US Air Mobility Command C-17A, giving position to Recife (Brazil) at 2233. (Perron-MD)
- 10116.9 BAF4-Beijing Meteorological, China, with a FAX upper air chart showing tropical storms, fuzzy reception at 1929. (Day Watson-UK)
- 10204.0 Sophomore-US military, calling Tall Corn, no joy at 0047. (Haverlah-TX)
- 10665.0 CIA "Counting" station (V5), with preamble and test count, tones at 10 after the hour, then 20 minutes of messages, sounded better in AM, several days of the week at 0300. (Larry McDermott-CA) *[Actually uses a reduced-carrier upper-sideband mode called R3E. -Hugh]*
- 10780.0 Cape Radio-US Air Force, Cape Canaveral, FL, working USS Underwood, King 1-3, and Blue Fin (US Coast Guard), discussing weather before space shuttle STS-106 launch, given a working frequency of 6724, at 0937. Nightstar Alpha-US Air Force E-8C JSTARS, with a patch to radar maintenance via Cape Radio at 1652. Pitt 01-US military, in a patch via Cape Radio to Bluestar (Roosevelt Roads, PR), at 2249. (Stern-FL) Stargate Bravo-US military, calling Fish Man, sent to UHF by Cape Radio, at 1939. (Steimel-AR)
- 11175.0 JU 118-US Navy C-9B, with a patch to maintenance via Salinas GHFS, PR, regarding a problem with the autopilot. The operator identified the station as "Salinas," except at the end when he goofed and said "Andrews," at 1952. LF 293-US Navy P-3C, with a patch via Ascension to their duty office at Jacksonville Naval Air Station, at 2220. (Stern-FL) Rats 69-US military, in a patch via McClellan Global, CA, to March Air Reserve Base, CA. McClellan actually IDed as such, first time this year, at 1701. Offutt-Offutt AFB, NE, working Doom 82, operator kept messing up the ID, at 2243. (Haverlah-TX)
- 11181.0 Jail Bait-US Air Force, in crypto checks with Hickam, tried different modem, still no joy, at 0404. (Stern-FL)
- 11220.0 Andrews-US Air Force, MD, working: Navy 515, a VP-3A, at 2014. (Perron-MD)
- 11244.0 Offutt-Offutt AFB, NE, with a Skyking broadcast, started to ID as Andrews before correcting self, at 0832. (Haverlah-TX) Razor 22-US Air Force E-8C JSTARS surveillance aircraft, working Canadian Forces Trenton Military, who sent him to frequency 11214, where repeated calls had no joy, at 2005. (Stern-FL)
- 11418.3 FJY5-Crozet Islands, with several personal e-mail messages back to France, ARQ at 0450. (Hall-RSA)
- 11432.0 Cuban "Atencion" station (V2), Spanish female AM "numbers," Friday at 0813. (Steimel-AR)
- 11460.0 SAM 300-US Air Force VIP flight, working Andrews VIP at 2117. (Stern-FL)
- 11590.0 Unid-Female English "numbers" voice, with two null messages, "637 00000" and "647 00000," Monday at 1200. (Steimel-AR)
- 12070.0 Enormity-US military, radio check with Pull Over, at 1647. (Haverlah-TX)
- 13375.0 Cuban "Atencion" station (V2), Spanish female AM "numbers," short transmission ending with "final, final" at 0710. (Steimel-AR)
- 14481.7 RFTJ-French Forces, Dakar, Senegal, with ARQ news in French and traffic for Port Bouet, at 0823. (MADX-MD)
- 14658.4 MTF-British Royal Navy, Falklands Islands, with RTTY (200/75) channel bulletins and testing, at 1740. (Hall-RSA)
- 14776.0 FM6FEM6-ALE ID for Federal Emergency Management Agency Region Six, sounding at 2257. (MADX-MD)
- 14983.2 RBV76-Tashkent Meteorological, CIS, with an extremely clear weather chart in 288/60 FAX, at 1727. (Hall-RSA)
- 15016.0 Offutt-US Air Force GHFS, Offutt AFB, NE, patching Snoop 47, an RC-135, to Snoop Ops. Operator goofed and identified as Andrews, then switched back, at 2055. (Perron-MD)
- 15633.0 HMF 26/35-Korean Central News Agency, Pyongyang, North Korea, with RTTY (250/50) test loop and frequency information, at 0950. (Hall-RSA)
- 16081.7 LKZGCG-Egyptian Embassy, Washington, DC, with ARQ 5-letter code groups to MFA, Cairo, at 1332. (MADX-MD)
- 16193.2 RFQP-French Forces, Djibouti, with ARQ at 1651. (Hall-RSA)
- 16347.0 FD18-Unknown French station, testing in RTTY (850/50) at 1708. (Hall-RSA)
- 17338.0 Gdynia Radio-Female ship to shore operator in Poland, speaking heavily accented English, taking phone patches with ships on 16456.0, at 1900. (Steimel-AR)
- 17421.7 DKQLP-Egyptian Embassy, Lagos, Nigeria, with Arabic traffic in ARQ for Cairo, at 1550. (Hall-RSA)
- 17423.7 KDFEPSV-Egyptian MFA, Cairo, calling QQTQ, Belgrade, Yugoslavia, in ARQ at 1544. (Hall-RSA)
- 17441.0 5YE-Nairobi Meteorological, with RTTY (850/100) weather reports at 0600. (Hall-RSA)
- 17940.0 N0102CX-Aircraft asking Houston Radio (LDOC), to pass his new arrival time to his company, at 2213. (Perron-MD)
- 18018.0 Unid-Spanish speaking male, aboard aircraft, giving position to an unheard ground station at 1335. (Perron-MD) *[?? - This used to be a US Air Force discrete frequency. -Hugh]*
- 18334.7 YKJKWL-Egyptian Embassy, Bamako, with Arabic traffic in ARQ for Cairo, at 1536. (Hall-RSA)
- 20975.3 P6Z-French MFA, Paris, with a FEC idler at 1608. (Hall-RSA)
- 23190.0 RFGW-French MFA, Paris, with FEC messages in 5- and 6-letter code groups to L9C, Buenos Aires, also using plenty of those silly French letter substitution codes, at 1650. (Hall-RSA)
- 26241.7 RFVIC-French Navy Le Port, Reunion Islands, with ARQ traffic, at 0748. RFVI-French Navy, Le Port, with ARQ messages in French for Djibouti, at 0814 (Hall-RSA)
- 26431.7 RUCXONI-Unknown NATO routing indicator, with ARQ message in 5-letter code groups to RFVIC/RFFINTF, French Navy, at 1656. (Hall-RSA)
- 27540.0 "69MU"-Partial callsign of a Costa Rican "freeband" station, calling Europe, at 1718. (Steimel-AR)
- 29945.0 Unid-Sounded like RTTY, 150-hertz shift, latest frequency for this uncopyable net, on for many hours after 1854. (Stegman-CA)

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Digital Utilities - Where to listen and what to log?

A common request at our Utility Monitoring Central website concerns where one should listen in order to hear the types of signals that we cover in this column. In an effort to oblige, we'll talk about this subject here, and discuss a few other operating disciplines that can improve your listening experience. After that, try for some of our example stations – the Tunisian Border Guard, the provincial police in Mozambique or the Spanish Police – all audible with the simplest of decoding gear.

❖ Digital Utility Frequencies

The general rule of thumb is to check in frequency ranges allocated to the “fixed” and “mobile” services. The International Telecommunication Union (ITU) recommends and coordinates how each range of frequencies should be used, and individual countries also modify these as required. The US National Telecommunications & Information Agency's Office of Spectrum Management carries a handy wallchart of the US allocations on-line (see Resources).

However, most diplomatic and other interesting users tend to take a rather loose interpretation of these guides. It's common for digital utilities to regard any frequency that's not allocated to powerful broadcast stations as fair game. Even so, and as you might expect for those organizations that want to stay hidden, there are plenty of cases where even this rule is broken. From our years of monitoring, these are the favorite bands that we scan for the majority of our digital utility listening:

3000 to 3500 kHz	13300 to 13600 kHz
3900 to 4100 kHz	13800 to 14000 kHz
4400 to 5900 kHz	14300 to 15100 kHz
6600 to 7000 kHz	15700 to 16450 kHz
7600 to 8300 kHz	17400 to 17550 kHz
8800 to 9300 kHz	18000 to 21000 kHz
10000 to 11600 kHz	22000 to 25000 kHz
12100 to 12300 kHz	

For those with receivers capable of listening to very low frequencies, there are also interesting digital things to be heard in the range of 10 to 350 kHz.

❖ Logging Digital Signals

We can't stress enough just how important a good logbook can be. There are plenty of examples that we've chronicled in this column where thorough logbooks coupled with some astute detective work have confirmed the migration of many well known networks from old RTTY-based to modern PSK-based systems.

Here's what we consider to be the minimum information for a useful logbook:

Date	Consider a standard format such as that proposed by the International Standards Organization (ISO) “YYYY-MM-DD”
Time signal on	Use the 24hr (military) clock and always state UTC
Time signal off	Use the 24hr (military) clock and always state UTC
Call sign	Indicate fictitious call signs with “” or append “****”
User	Name of the organization
Location	Indicate town and country, and consider ISO standard country codes for brevity
Speed	Signal speed in baud or bps

Shift	Shift (Hz) between tones (for MFSK and FSK signals)
Polarity	Reverse (Inverted) or Normal (Erect) tones
RC	Number of repetition cycles
Details	The contents of the transmission. Be as detailed as you can.

You can see examples of this format in use at Utility Monitoring Central (see Resources). Just follow the “Latest Logbook” link from the home page.

There are plenty of software programs (see previous *Computers and Radio* columns in this magazine) available to help in the task of logging stations, but it's also easy to “roll your own” using software commonly bundled with most PCs these days. Microsoft's “Access” database or “Excel” spreadsheet will readily make for a very capable and functional logbook. These programs also have so-called “wizards” which make setting up a logbook a snap and other features which make importing and exporting data to other formats quick and simple.

❖ Listening Around

With winter here and a less static-filled ether to enjoy, it's worth checking a few exotic digital stations that you should be able to hear now.

Tunisian Ministry of the Interior

Tunisian Border Guards and Customs units can be heard transmitting a variety of traffic using the ATU-80 Arabic alphabet on the following frequencies:

3331, 3938, 4423, 5476, 5796 and 5831 kHz

Standard RTTY is used at 50 bd with a shift of 170 Hz. The majority of messages concern passport checks and travel visa information from a number of locations throughout the country including Tunis and Monastir. The stations are easily recognizable by their characteristic “kfkfkfk” lead-in before messages.

Mozambique Police

This network, linking law enforcement agencies in all provincial capital cities, can be heard on the following frequencies:

10445 and 11625 kHz

Standard SITOR-A is used and stations send a three-letter callsign (eg “LCH”) in CW and SITOR phasing bursts when idle. SELCALs (selective calling) are in the series SSxx. A mailbox system is used to transfer messages in a similar fashion to that used by maritime stations. Most distinctive, and unusual, is the use of an off-line encryption scheme that mixes letters and numbers, as in the following example:

IIIII bwdjr cq8bi gq9n2 ievri 7lo4g leurk x2vlo dlfza zwlr7
wx7p 7fnpu drqiw mrljck az4nw ou2rt pnbwx ky7kp jypw7 pilkk

Operators can often be heard exchanging chatter in Portuguese in between messages.

Spanish Police

This is perhaps one of the most famous and extensive of HF police networks, using a distinctive 400

Hz shift SITOR-A system with inverted tones. The Guardia Civil can be heard both day and night on the following frequencies:

2216.5 2237.5 2490.5 2752.5 3168.5 3219.5 4029.5 4493.0 4562.5
4563.5 4597.5 4751.5 4752.5 4785.5 4911.5 4913.5 5008.5 5287.5
5289.5 5320.5 5321.5 5353.5 5380.5 5381.5 5869.5 5872.5 6797.5
6933.5 8176.5 9179.5 9268.5 9296.5 11107.5 13376.5 14346.5
14636.5

Messages can be transmitted in either plain language Spanish, in which case standard NATO message formatting is used, or on-line encrypted when the receiver will be told to expect “cifrado.” SELCALs are formed from the last four letters of the station's NATO routing indicator. For example SELCAL “TWNA” for Palencia whose routing ID is “RETWNA.” Here is an example of the message formatting typical of the GC:

vzczc 000 uu
rr retwb
de retwbm 532 0111620
znr uuuuu
r 111620 ene 97
fm jecor manresa
to retwb/jezo barcelona

bt
sinclas

motivo: sustraccion
matricula: b-1057-kk
tipo de vehiculo: turismo
documentacion: sustraída
marca: ford

bt
nnnn

❖ New ALE Network

Leif Dehio and Day Watson both report an interesting new ALE network operating from Africa on 11200 kHz. Station locations all follow towns along Gabon's railway system, so it's quite possible that this is the organization behind the facilities. The identifiers in use are:

BB113 = Unknown
FRANCE = Franceville
MBOUNGOU = Mboougou
MILOLE = Milolo
PCBOUVE = Booué
PCOWENDO = Owendo
RC1 = Unknown
CC11 = Unknown
CC17 = Unknown

Until next month, enjoy the digital DX!

Resources

International Telecommunication Union - <http://www.itu.int>
NTIA - <http://www.ntia.doc.gov/osmhome/allocrht.html>
Utility Monitoring Central - <http://www.mindspring.com/~mike.chace>



Glenn Hauser, P.O. Box 1684-MT, Enid, OK 73702

E-mail: wghauser@yahoo.com

Web: www.angelfire.com/ok/worldofradio

Silent Shortwave Countries Now Webcasting

ANDORRA: Radio Andorra broadcasts in Catalan daily 0500-2200 UT on 91.4 and 94.2 MHz plus live audio stream at <http://www.andorra.ad/rtvasa/rna/ra/menu.htm> Newscasts: 0530-0600 M-F, 0630-0700 Su and Sa, 1100-1130 and 1800-1830 daily (presumably all times one hour later now). Baixada del Molí 22, Andorra la Vella, Andorra. Tel: +376 863777; Fax: +376 864999; E-mail: rtvasa@andorra.ad

BRUNEI: Radio Brunei, broadcasting on FM only, has experimental live audio services via <http://www.rtb.gov.bn> in Malay daily, Radio Brunei Rangkaian Harmoni at 2200-1600; Radio Brunei Rangkaian Nasional at 2030-1600; the Islam network, Radio Brunei Rangkaian Nur Islam at 2200-1400; the Rainbow network, Radio Brunei Rangkaian Pelangi at 2200-1600; and the Choice Network, multilingual in English, Mandarin, Ghurkali, Radio Brunei Rangkaian Pilihan at 2200-1600. Address: Radio Brunei, Prime Minister's Department, Jalan Stoney, Bandar Seri Begawan BS 8610, Brunei Darussalam (© BBC Monitoring)

Harmonic DX Now At Solar Max

A new listserve has been set up for rapid exchange of harmonic DX info, initially featuring primarily the daily loggings of founder Tim Bucknall in Cheshire. Here are some of his catches in October; B-00 seasonal fundamental changes will have led to different harmonic frequencies in some cases by now. Go to the eGroups site at <http://www.egroups.com/invite/harmonics> and click the "JOIN" button.

Here we have collected Tim's loggings into descending frequency order. More than one time for a frequency means heard on different days.

35625	R Cairo	(3 x 11875) 1613
35350	V of Russia	(2 x 17675) 1310
30500	R Romania Intl	(2 x 15250) 1100
30450	VOA, Ascension	(2 x 15225) 1609
30210	R Romania	(2 x 15105) 1235 Actualitatsi
29805	ERT, Athens	(3 x 9935) 1536
29721	ERT, Athens	(4 x 7430) 1606
29721	ERT Athens	(4 x 7430) 1502
29565	CRI (tent)	(3 x 9855) 1036 to fade out 1043
29080	R Tirana	(4 x 7270) 1538
28860	R Ukraine Intl	(3 x 9620) 0914
28860	R Ukraine Intl	(3 x 9620) 1046
24150	R Netherlands	(2 x 12075) 1541 via Uzbekistan
23960	Egyptian R	(2 x 11980) 0845 Abu Zabaal

23750	R Cairo	(2 x 11875) 1613
23660	R Romania	(2 x 11830) 1633 domestic
23540	RFE, Morocco	(2 x 11770) 1549
23400	R Bulgaria	(2 x 11700) 1550
21630	Belarus R	(3 x 7210) 0930, 1102
19920	unID, R Tirana?	(2 x 9960) 1740 Carrier off, then on again then off again; the technical difficulties would certainly suggest Tirana. HI!! Very tentative.
19870	RS Makedonias	(2 x 9935) 1739
19800	R Bulgaria	(2 x 9900) 1819
19760	R Prague	(2 x 9880) 1056*
19720	BBC Tashkent	(2 x 9860) 1455 Nepalese
19702	R Cairo	(2 x 9851) 1554
19700	R Cairo	(2 x 9850) 1737, 1608
19690	RFI Allouis	(2 x 9845) 1818 Farsi
19630	RDP Portugal	(2 x 9815) 0922 S9!!
19620	V of Russia	(2 x 9810) 1608 French; 1735; 1811
19550	V of Russia	(2 x 9775) 1733 St Pete
19440	R Rossii	(2 x 9720) 0925; 1100; 1228
19430	R Tashkent	(2 x 9715) 1226
19430	Uzbek R	(2 x 9715) 1606
19380	R Thailand	(2 x 9690) 1809 Thai to Middle East
19360	RFE/RL	(2 x 9680) 1610, presumably from the Sri Lanka as unlikely Biblis would be radiating harmonic
19280	R Ukraine Intl	(2 x 9640) 1053; 1101; 1230; 1604
19240	R Ukraine Intl	(2 x 9620) 1007; 1101; 1230 Khar'kov
19170	R Tirana	(2 x 9585) 1103
19080	Uzbek R	(2 x 9540) 1614
19080	R Polonia	(2 x 9540) 1110 Russian
18980	R Rossii	(2 x 9490) 1626
18980	TWR, Monaco	(2 x 9490) 1229
14940	V of Russia	(10 x 1494) 1516; 1653 English; 1851 religion from St Petersburg
14760	V of Russia	(2 x 7380) 1654 German; 1727; 1848; Yekaterinburg
14710	R Rossii	(2 x 7355) 1845; 1945; Samara
14640, 14570, 14550		unIDs all at 1716
14540	R Tirana	(2 x 7270) 1540
14470		unID at 1715
14420	R Tirana	(2 x 7210) 1912 French news
14365	V of Russia	1920 - English // 1386, 7440 intermod product, fundamental unknown
14320	RFI, unID site	(2 x 7160) 1905
14220	R Ethiopia	(2 x 7110) monitored from 0929, YL DJ in unfamiliar language, wailing mx/pops, unfamiliar national anthem at 0955 and sign off at 1000 (very tentative)
12385	R Rossii	All saints mx 1858, intermod product, fundamental unknown
7950	R Budapest	(2 x 3975) 1855
7910	R Taipei Intl	(2 x 3955) 1816; 1856 via Skelton

ALGERIA There was no trace of any SW out of Algiers in mid-October: nothing heard on 7245, 11715, 11750, 15160 (Noël Green, UK, *DX Listening Digest*)

AUSTRALIA RA planned to use 9580 from 0800 instead of 1100 for B-00 in lieu of 13605 which has serious interference from VOA Tinian on 13610. 9580 might not be brought up until 0805 due to BBC running past 0800 with news (Morrison Hoyle, Victoria, *DXLD*)

RA hopes to be back on in Asia effectively in the New Year; planning not only on SW but also satellite. Priority goes to Asian languages over English; strategy will

be shorter broadcasts throughout the day rather than big blocks. Trying to pick best times and sites, taking into account what others are doing. But there will be more hours of English than had been expected. The enhanced service to

Asia will free up some frequencies, allowing service to the Pacific also to be improved (RA Network Manager Jean-Michel Manguy on *Feed-back*) Darwin/Cox Peninsula never mentioned on this occasion, but presumably alluding to relays via Christian Voice (gh)

AUSTRIA ORF B-00 program schedule shows English, daily u.o.s.: 0230, 0737(Sunday 0730),

*All times UTC; All frequencies kHz; * before hr = sign on, * after hr = sign off; // = parallel programming; + = continuing but not monitored; 2 x freq = 2nd harmonic; B-00=winter season, October 29-March 31; [non] = Broadcast to or for the listed country, but not necessarily originating there; u.o.s. = unless otherwise stated*

1000-1045 Sat *My Music*, 1230 Mon-Sat, 1335 Sun, 1430, 1630 WNAW via Sackville, 1930, 2230 Mon-Fri. Frequencies were slow to emerge, but check the usuals such as 9870, 13730. RAI's English broadcast at 1500 and Spanish at 1530 via RCI Sackville 17865 disappeared in Oct, replaced by German, due to a "software bug" – but this went on for weeks. Check what the hour now at 1600 really contains.

Shortly after installing its own new digitally-equipped studios, RAI had a 50 percent staff cut, was moved from its own studios into the home service building involving dismantling and reinstalling its equipment, and is expected to relay mostly domestic programming instead of producing its own. A survey was being taken among German-speaking listeners on whether the *Intermedia* program should be continued.

Due to RAI's own forced cutbacks at the Moosbrunn site, spare time is now brokered by Merlin (gh, *World Of Radio*) From 29 October, only one hour of Austria via Sackville, at 1600-1700 on 17865. The evening block 0500-0700 is dropped. Gérald Théoret says that it may not affect RCI's use of Moosbrunn at the outset, though will have to pay for the time that we use over the amount of time exchanged (Bill Westenhaber, RCI)

Budget for next year will be 90 million ATS instead of just 80 million as originally expected, slightly more than half the previous one. This allows RAI to keep all Arabic, Esperanto and Spanish though cut by half. The whole program volume is reduced from around the clock to 14 hours. On shortwave RAI will continue to serve all target areas for "at least one hour per day." During recent weeks RAI moved from the ORF centre into the Argentinierstrasse radiohouse of the domestic services. Absolutely unable to judge whether or not RAI will continue to exist beyond 2001 (RAI director Roland Machatschke, *Intermedia* via Kai Ludwig, DXLD)

CANADA RCI indicated that for the B-00 season, its programming in French would almost double, including a new broadcast to Africa to replace *Tropicque Nord* which was cancelled under the pretext of poor reception (RCI via Jean-Michel Aubier)

CHINA *The Messenger* is now a multi-colored 8-pager which may be a nightmare for the elderly and partially sighted to read. Each page has a solid colored background under black type as small as 5 points (World DX Club *Contact*)

[non] After missing almost a month, CRI relay on 9730 in English at 0400 was back Oct 7, before the usual French Guiana relay was resumed. Unlike the other clients, CRI was not forthcoming about what substitute site was used (gh)

COSTA RICA On 4260.66, TIRP, Radio Pampa, Nicoya (harmonic 3 x 1420) at 1005 LAM vocal, IDs in passing between songs. Fair to poor signal with het and CW QRM (Mark Mohrmann, VT, DXLD) RFPI resumed 30 kW on 42m, adjusted to 6969 kHz (gh)

CROATIA We are forced to stop transmission of Radio Croatia as of October 1, 2000. We have done everything in our power to secure the funding and thus continuation. Regrettably, it is the Government's opinion that SW is costly and unnecessary, and must be terminated (Marica Risek, Croatian Radio via EDXP) You would never know it from their press releases but this only concerns time purchased for relays via DTK Germany, e.g. 9925 at 2300-0500; continues to Eu via Croatian transmitters. And several previous English and Spanish newscasts are available on demand from: http://www.hic.hr/radio/Radio_Croatia/index-eng.htm (gh)

Hans Weber reported a couple of years ago the shortwave equipment at Deanovec is two 10 kW transmitters and a single 100 kW unit, while the antenna capacity is limited to two vertical monopoles and a rhombic; the RHO and one of the VM's can handle 100 kW, the other VM 10 kW only. In addition they still have the tiny 2 kW transmitter they used to start the shortwave operations; in previous seasons they used this rig to experiment with 13 metres transmissions. I guess the 100 kW unit is operational on 9830, as this is the strongest signal. [Rather than several 100 kW as claimed] (Kai Ludwig, Germany, DXLD)

DOMINICAN REPUBLIC The newspaper *Hoy* reported that from Oct 29 clocks would be set back one hour in keeping with the season, UT-5 instead of UT-4. This had not been done for many years (Dino Bloise, FL, DXLD)

ECUADOR On 4814.9, R. Alli Michic was heard on a visit to Cuenca at 2210-2330, SINPO 4444 with modern religious music in Spanish and dialect, finally ID (Pedro F. Arrunátegui, Ecuador, *Chasqui* DX)

ETHIOPIA [non] Voice of Ethiopian Medhin News and Information Board Proudly Announces a Radio Broadcast to Ethiopia and neighboring countries, in Amharic twice weekly every Thursday, and Sunday starting at 7:00 p.m., Ethiopian time, on 15365 kHz [1600 UT via Germany]. *Medhin* stands for unimpeded expression of ideas, free flow of information, and news via electronic and print media. The radio program will be available via Real Player on Voice of Medhin's Web Page <http://www.medhin.com> or <http://www.medhin.org> Objectives are to counter propaganda of the ruling class which has muffled independent press; contribute to the struggle for multi-party democracy against dictatorial one-party rule; promote unity among all Ethiopians, individual rights, freedom of worship, gender equality; and promote Ethiopia's culture, tradition, folklore, and mores. The present regime is promoting uninhibited destruction of the country's historical relics and artifacts, which must be protected by all Ethiopians. The program is intended to enhance awareness and promote the safe-keep of the nation's irreplaceable wealth. (Medhin website via Nick Grace C., *Clandestine Radio Watch*) EMDP is a questionable "political party" whose strength appears to be on paper alone. The group produces a monthly magazine, called *Medhin* as well the website; now they have a radio program. EMDP can be reached at: P. O. Box 13875,

Silver Spring, MD 20911-3865, USA and/or Medhin Dimts, Postfach 111423, 60049 Frankfurt/Main, Germany (N Grace, CRW)

ICELAND Since 1 Oct, the Icelandic State Broadcasting Corporation (Ríkisútvarpið Reykjavík) via coastal station TFA: Eu 1215-1300 13865, 1755-1830 11402; USA 1410-1440 13860, 1835-1905 13860, 2300-2330 11402. At the end on Sats and Suns there is a special summary of the week's news (Reykjavík Radio via Bernd Trutenau, Lithuania, BC-DX)

IRAN [non] Radio Iran of Tomorrow in Farsi: 1800-1830 on 5830 via Dushanbé, Tajikistan; 1830-1900 on 12055 via Moldova, QRM Radio Cairo on 12050 (*Observer*, Bulgaria) Radio Iran of Tomorrow, formerly known as Radio Tomorrow's Iran (Persian: Radio-ye Iran-e Farda) was first observed by BBC Monitoring on 7th December 1998 with announced test transmission. Affiliation unknown; the radio describes itself as "the voice of all of Iran's national and free thinking forces" and says that it supports "the struggle of clerics and religious forces who wish to see the separation of religion and government." Web site gives a US-based fax number [Portland, Oregon area]. It is believed to broadcast via hired transmission facilities in Tajikistan or Moldova. Fax: +1 503 218 9488; E-mail: riot_studio@hotmail.com Web Site: <http://www.riot.com> (© BBC Monitoring) Website has several programs audio on demand, including future ones (gh)

ISRAËL Galei Zahal was being heard in European evenings on 2442.2 from mid-September (Alan Pennington, BDXC-UK) At first thought to be spurious or harmonic, but 2442 was actually listed as 4XB.... 1 kW from Tel Aviv in *WRTH* issues such as 1968 and 1974; so reactivated (Pennington and Wolfgang Büschel)

KASHMIR Interesting verie letter for V. of Jammu and Kashmir Freedom received from v/s: Islam-ud Din Butt (no title), who was happy to be heard in the US. Says English bulletin and commentary is at 1420-1430 on 5100; actually heard back in April on 5101.23. Returned my \$1; address is Voice of Jammu & Kashmir Freedom Movement, Post Box No. 102 Muzaffarabad, Azad Kashmir, Pakistan (Terry Palmersheim, WA, *hard-core-dx*)

LIBERIA The B-00 schedule includes "KVOH" from this country on 6280 at 2000-1000, 11530 at 1000-2000, both 10 kW, 75 degrees to Central Africa, designated "A" for alternate usage, to what? (George Jacobs & Associates via Jim Moats) We may recognize these frequencies formerly from alphabetical neighbor LEBANON. Why would anybody voluntarily go into another hellhole like Liberia? Gotta have High Adventure! (gh)

LIBYA You never know when English will show up on V. of Africa, 17725; one day it was at 0205-0215, excellent signal and modulation for a change (Brian Alexander, PA, *DX Listening Digest*)

LITHUANIA R. Vilnius announced that for B-00 English to NAM would move as usual from 9855 to 6120 (via Germany) (Bob Thomas, CT, DXLD) Presumably still at 0030? (gh) Said it would shift to 0130 (Jonathan Murphy, Ireland, via Mike Barraclough)

MOLDOVA [non] I called the French service; Radio Moldova Int'l stopped all SW broadcasts September 4th. Financial reasons forced them to cancel these broadcasts (RMI couldn't pay for the electric bill). But programmes are now on Internet in 5 languages at <http://www.trm.md/radio> (Jean-Michel Aubier, France, DXLD) They were via Romania (gh)

NETHERLANDS Media Network announced Sept 21 it would become a web-only production as from Nov. The last edition of the radio show would air Oct 26. Jonathan Marks explained that since the departure a week before of co-host Diana Janssen, he did not have the time, due to his other responsibilities, to continue producing the program himself at the high standard of the past 20 years. Andy Sennitt will maintain and expand Media Network's web presence via <http://www.medianetwork.nl> This led to an outcry to "save" the program. We noted that RN is known for canceling its most popular programmes to the consternation of faithful listeners. Some people still have not forgiven them for doing away with *The Happy Station*. If Jonathan can't produce *MN*, no one should? What about all the "teamwork" hype of the past 20 years? (gh)

NIGER La Voix du Sahel heard Sept 30, at 2200 at 9705.6 with pop mx, phone calls from listeners, IDs, all in French; unusual this frequency for the night broadcast. 5020 was silent (Erich Bergmann, Germany, BC-DX)

NORWAY Frequency manager isn't Mr. Ohta, but Erik Johnsraten, Norwegian Post and Telecommunications Authority. E-mail: erik.johnsraten@npt.no (Erik Køie, R. Denmark)

PERÚ New stations: 5235.5, Radio La Voz de Abancay, Abancay; was first observed Sept 29, during my stay in Abancay. 5235 kHz (0.25 kW) at 0900-2400 daily. The shortwave outlet remains around 5235 kHz, on which Radio Apurímac formerly operated; however, does not use the transmitter of Radio Apurímac. Owned by Lucio Fuentes, the founder and owner of Radio La Voz de Andahuaylas. Address: Av. Noviembre Lote 6, Urbanización Micaela Bastidas, Abancay, Departamento de Apurímac, Perú.

6292.1, Radio Uripa, Uripa, Provincia de Chincheros; was first noted Oct 2 during my stay in Andahuaylas. I visited the station, founded by Lorenzo Alejandro Espinoza, and started the transmissions in May of 1999. The ownership was transferred to the current owner Lorenzo Quispe Nauto on November 15, 1999. The transmitter was made by Lucio Fuentes, the founder of Radio La Voz de Andahuaylas. Its nominal power is 0.25 kW. The station runs at 1000-1600 and 1900-0100 daily. Address: Avenida Tupac Amaru s/n, Uripa, Provincia de Chincheros, Departamento de Apurímac, Perú (Takayuki Inoue Nózaki, *Relámpago DX*)

Radiodifusión Comercial Naranjos, Rioja, San Martín, 0928-1023, reactivated on 4299.98v. Thanks to Henrik Klemetz for filling in the blanks. Andean vocals, canned ID, announcer with time check and IDs in passing

between songs. Fair signal with u/e QRM above and below varying from day to day (Mark Mohrmann, VT, *DXLD*)

unID on 4389 at 1007 with Pentecostal program in Spanish, rapidly fading by 1100 (Dave Hodgson, TN, *DXLD*) 4388.97, unID at 0849-1030, Andean vocals with good levels but announcer with very low level audio. IDs sounded like "Radio Estéreo"; 0930 Pentecostal Church program, apparently taped. Definite mention of "Bambamarca." Fading with sunrise by 1030 (Mark Mohrmann, VT, *DXLD*) It is R. Estéreo, 4388.8, at 2308-0110, new from Distrito José Leonardo Ortiz in Chiclaque. Noted with program *Magazin* 14-90; at 0000 *Órbita Deportiva*. Later, evangelic program from La Iglesia Pentecostal La Cosecha. Does not mention QTH.

R. Ondas del Pacífico, 6782.5, 2234-2350 Sept 30, new station with Colombian *vallenato* music, 2300 *La Hora de la Cumbia*, sabor tropical. Mentions address in Ayabaca (both: Rafael Rodríguez R., Bogotá, Colombia, *DXLD*)

R. Tacna reactivated 9504.6 after several years, 2230-2300 Spanish, news magazine, jingle, advertisement, several IDs, better in LSB mode due to heavy QRM from R Record (Michael Schnitzer, Germany, *hard-core-dx*)

R. Fuego, 104.7 FM was heard relayed on 10000-USB at 2200-2348+ probably by pirates or those using this frequency for two-way narco-traffic, despite it being reserved for standard frequency/timesignal stations such as WWW, LOL (Gabriel Iván Barrera, Argentina, *DXLD*)

FCC should protest to ITU and all South American telecom administrations for the "laissez-faire" situation this freq is subject to. There is apparently no control of transceivers allowed to operate in the 10 MHz ham radio band. This is a problem that is happening here for years (Horacio Nigro, Uruguay, *DXLD*)

SERBIA The change of government was widely speculated to lead to the resumption of R. Yugoslavia on SW, but nothing had happened by mid-October (Ivan Grishin, *DXLD*) When the RY shortwave facility near Bijeljina was closed, an Independent Media Commission spokesperson told me the reason was that no broadcast facility in Bosnia can be foreign-owned. Even though Miloshevic is gone, the foreign ownership issue remains. Bosnian ownership would have to be established, then it might become a shortwave-site-for-hire. With the financial problems faced by the new Yugo government, I wonder if shortwave broadcasting will be a high priority? (Kim Elliott, *swprograms*)

Radio Yugoslavia internet audio has been difficult to access and maintain; but there is printed news from their web site (which is also very slow in coming up, but patience is rewarded.) There has been a marked change in tone: <http://www.radioyu.org/news.html> (John Figliozzi, *swprograms*)

SOMALIA This page has some interesting history on Radio Hargeisa: <http://www.dm.unipi.it/~jama/mypage/idaacadda.html> (Hans Johnson, *Cumbre DX*)

SRI LANKA. SLBC, 11905 in Hindi starts with music at 0020, 0025 ID, 0030 news. ID is "Yeh Sri Lanka Broadcasting Corporation..." "Yeh" is pronounced [yee]. I have not been able to hear 15425 in English for a few weeks (Liz Cameron, MI, *DXLD*) 15425 is still very much on. Remember it is only 25 kW compared to Iranawila 15250 and any DW Trinco outlets. SLBC finally dropped SE Asian service at 1030-1130. All Asia English continues and should do so for a few years, still 0025-0430, 1225-1545 6005 (10 kW), 9770 (100 kW running at about 80 kW the Marconi SEAC) and 15425 35 kW VOA Collins (Victor Goonetilleke, SL, *DX Listening Digest*)

SWEDEN B-00 R. Sweden English to NAm: 1230-1300 18960 280 degrees; 1330-1400 18960 305 (also to As/Au/NZ 85 17870 and 45 9425 or 17505); 1430-1500 18960 320 (also to ME/Au/NZ 70 on 17505); 0230-0300 9495 or 7155 290; 0330-0400 9495 320 (Swopan Chakroborty, Calcutta, India, Oct 9, *DX Listening Digest*)

TAIWAN RTI will soon add Burmese, and plans to add more languages, especially concerning countries with trade relations. The station is overstaffed at 550 after a merger. Unlike many SW stations, does not plan any cutbacks (Olivia Pan, Spanish section manager, RTI, interviewed by Jeff White, *Radio Enlace*)

TURKEY Glenn, I returned in Sept 2000 from a two-week holiday in Turkey at the invitation of the TRT/Voice of Turkey. I was one of 10 winners of their 1998 essay competition. The other winners came from the USA, Germany, Macedonia, Egypt, Hungary, Kazakhstan, Iran, among others. There seem to be very few competitions on international radio these days compared with twenty years ago, and I can recommend other listeners who have the time to do the necessary research to enter TRT's competition (it has been running now for 13 years). Our trip took us to Istanbul, Izmir, Anatolia, Ankara and other places.

In Ankara we not only visited the TRT headquarters but stayed there in their own hotel which is part of the TRT building. The TRT building is an enormous place. I was told it is the second biggest building of its kind in the world, after the Pentagon in Washington. It contains a vast number of recording and on-air studios, as well as shops, restaurants, banks and the hotel. There are currently eight staff in the English section, led by the very courteous Osman Erkan, whose voice is well known to TRT listeners. The English staff operate from a single small room consisting of just four desks, a number of old typewriters and a computer.

They have the reputation – understandably from my experience – of being the most liberal and unconventional people on the TRT staff, and they all have a good sense of humour. The studios are cool and well-maintained. Engineering is done from a control room next to each studio; I did not see any self-operated DJ-type facilities. Each control room I saw was equipped with

Revox reel-to-reel recorders. Digital recording, apparently, has not yet reached the TRT.

Overall, my impression is that Turkey is interested in communicating with the outside world, and does so more effectively than, for example, the Greeks do through the Voice of Greece. I was told that the TRT currently broadcasts in 26 different languages, including some esoteric ones (such as Tartar) that are not normally used in international broadcasting. The English staff, in addition to preparing the news, press review and three features daily for overseas listeners, provide 13 newscasts daily for the TRT tourist stations and the TRT 3 domestic service, as well as additional English features for the tourist stations that are not heard on the overseas service.

I criticised some aspects of the station's news and current affairs coverage and got the impression that the small staff who prepare these programmes work under great pressure. The Voice of Turkey has introduced new programmes for the season. One that grabbed my attention is *Wonders of the World*, looking at the seven wonders of the ancient world, Mondays at about 15 minutes into the transmission; *Letterbox* is every Wednesday, and *DX Corner* every second Saturday (Roger Tidy, UK, *DX Listening Digest*)

USA WRMI began testing new 15725 Oct 10, weekday daytime only, as early as 1300, late as 2200, mainly for the apocalyptic Christian Media Network 1600-2100, filling with classical music elsewhere. Tho beamed right at us, the signal was weaker than WYFR, WWCR and other US SW stations near the same frequency not beamed at us. But at least no Cuban jamming yet, a clear frequency except for Pakistan English news bet from 15725.5 at 1559-1613 (gh, OK) WRMI 15725 test 50 kW, 317 degrees to zones 2, 3 (*Observer*, Bulgaria) 15725 is a bad choice for DXers as this will block Congo's Radio Télé-Liberté which has been using this channel after 1800 (Hans Johnson, *Cumbre DX*) But has anybody heard that lately? (gh)

Mi Seferino, a monthly program for the past sesquicentennial on KUNM Albuquerque, is adding SW via WRMI and IRRS Italy. Producer and host Lorenzo Domínguez says it is about the *Conversos* or Crypto-Jews. Conversos were Spanish and Portuguese Jews forced to convert to Catholicism during the Spanish Inquisition. Crypto-Jews, many of whom were the first Spanish settlers in what is now New Mexico, were those who continued their Jewish traditions in secret. Domínguez only recently uncovered his own family's Jewish roots (Tema Milstein, *The New Mexico Jewish Link*) See website <http://www.miseferino.com> - Host is Levi ben Macario on WRMI, 7385: UT Sat 0600-0630 following the 2nd, 4th, and if any, 5th Fridays (alternating with *Seldom Heard Radio*), repeated Saturdays 2200 on 9955 (WRMI)

Seldom Heard Radio is my new show on WRMI, 7385, 0600-0630 UT Sats [after first and 3rd Fridays]. Focus on obscure folk / folk-rock / psychedelic music from the Americas, Europe and around the globe (Frederick Moe, *Seldom Heard Radio*, 36 West Main Street, Warner NH 03278, *DXLD*)

The Scream of the Butterfly is joining WBCQ from November, UT Sats 0000 on 7415; continues on WRMI, 7385, UT Sundays 0500. Occasional European relays via Radio 510/IRRS in Milan, Italy will also continue. We QSL 100 percent of the postal reception reports we receive: The Scream of the Butterfly, P O Box 1994, Rancho Cordova, CA 95741-1994. Please enclose \$1 U.S. or 2 IRCs for postage and printing. Our email address is: johnnyrockin@hotmail.com web page: <http://www.geocities.com/SunsetStrip/Garage/9861/> (Johnny Rockin', *SOTB*, *DX Listening Digest*)

WBCQ has new address allanhw@hotmail.com WBCQ moves from 9330 to 9335-CUSB, to get further away from WGTG 9320 (Allan Weiner, WBCQ) Unfortunately, North Korea is already on 9335 (gh)

KPM556, the studio feeder in Portland OR, heard worldwide via 25950 kHz, now has a webpage and even streaming audio per a message from Larry Holtz, Dir. of Engineering. This is quite unique for a cue station (Guido Schotmans, Benelux DX Club) When we don't have a particular studio program on the feeder, we send a reggae music format with the KPM556 ID. The stream can be heard at <http://209.20.223.122:8000> and a description of the station is at <http://209.20.223.122/index.htm> (Holtz, Portland Entercom Communications KGON/KKSN FM-AM/KRSK/KNRK/KFXX via Schotmans, BDXC) 100 watts AM, and sometimes uses 25870, 25910 or 26100 (from above website)

Since some potential contributors do not want to be identified or on mailing lists, WWCR will accept donations confidentially to support particular programs or WWCR in general (WWCR announcements)

UZBEKISTAN New E-Mail address of Radio Tashkent International: uzradio@uzpak.uz (Fritz Andorf via Volker Willschrey, Saar, *DXLD*)

VANUATU R. Vanuatu reactivated 7260 from Oct, clear in Europe; 0615 religious program in English, Bislama, 0631 interval signal of drums and chirping yellow bird, ID and news in Bislama, fading by 0700 (Michael Schnitzer, Germany, *hard-core-dx*)

VENEZUELA On 4830.1, Radio Táchira at 0331, back on in Oct after a few months absence. ID and LA pop music. Excellent signal as usual (Mark Mohrmann, NY)

Venezuelan government station list shows 4730 for projected station: (Henrik Klemetz) Thaïs White is awaiting construction permit for her SW station at San Juan de los Cayos, Falcón state; at first will be 1 kW with a dipole, possibly expanded later adding AM or FM. Expects to promote tourism among the Venezuelans. The town has no radio station of its own, so may also provide local service. Expect everyone there will buy a shortwave radio when it comes on. Mostly local productions with very small staff. Her father is very involved in the project (Jeff White, HCJB *DX Partyline*)

Until the Next, Best of DX and 73 de Glenn!

Broadcast Logs



Gayle Van Horn

0000 UTC on 9755

CANADA: Radio Canada Int'l. Station ID to report on Gulf Air; 0400-6145; 0500-6145. (William McGuire, Cheverly, MD) *Maple Leaf Mailbag* show with an appeal for pen pals, 2140-17870; *As it Happens* investigation into polluted drinking water at Walkerton. (Bob Fraser, Cohasset, MA)

0000 UTC on 9540

SPAIN: Radio Exterior Espana. Spanish service with pop music, ID and interview segment; 0100-11680 Spanish national to regional news; 0300-6125. (McGuire, MD) 0036-0042+ on 6055. Feature on cataloging monasteries and 18th Spanish music. (Harold Frodge, Midland, MI)

0016 UTC on 6673.2

PERU: Radio Super Nueva Sensacion. Spanish announcer's newscast, regional music program and time checks. Station audible on subsequent monitoring 2329-0020+. Peruvian's audible; **Radio Ancash** 1042-4992, slight drift from reported 4991. **Radio Ondas del Rio Mayo** 2335-0015+on 6797.7; **Radio La Voz de Campesino** 2340-6956.6; **Radio Villa Rica** 2358-4888.8 kHz. (Roger Chambers, Utica, NY/ODXA)

0046 UTC on 6956.6

PERU: Radio Voz de los Campesinos. Spanish. Music and "Atencion" to station identification at 0048. Mentions of city Huarmaca to brief IDs before 0100. Chit-chatty announcer, signal better than recent nights. (Frodge, MI)

0540 UTC on 7210.27

BENIN: Radio du Benin. Fair signal at tune-in for vernacular and French talk. Good signal for subsequent rechecks the following day at 0601, noted "Radio National du Benin" ID. (Walter Salmani, Victoria, BC, Canada/Hard Core DX)

0950 UTC on 4926.4

BOLIVIA: Radio San Miguel. Spanish male/female duo with mentions of city Riberalta and regional music. Signal peaked at only fair quality at 0950. (Chambers, NY/ODXA) Bolivia's **La Cruz del Sur** 1002-1022, 4876.74. Long talk in presumed Aymara of possibly a religious text. Canned announcements and one mention of "Panorama de Bolivia" promo. Fair signal, fading. Noted earlier 0940 on 4876.78 with co-channel interferences. (Dave Valko, PA/Cumbre)

1054 UTC on 6130

LAOS: Lao National Radio. Laotian. Southeastern Asian pop music to beautiful instrumental music to 1100. Time tips signal and lady's voice over at 1104. Continued Asian pops to seven Big Ben bells and mention of Laos. Fair signal with co-channel interference on 6125. (Valko, PA/Cumbre)

1059 UTC on 4753.3

INDONESIA: (Sulawesi) RRI-Ujung Padang. Very poor signal quality for repeated interval signal of eight tone chime melody, time tips and national anthem. (Chambers, NY/Cumbre) Indo's **RRI-Jambi** 1105-4925, Koran recitations to brief announcer segment. Good signal, best Indo this morning. **RRI-Merauke** 1109-3905, with nice orchestral version of *Padamu Negeri* theme song. Announcer's talk with ID into lively Indo pops. Weak signal quality. (Valko, PA/Cumbre)

1106 UTC on 3905

PAPUA NEW GUINEA: Radio New Ireland. Regional news and announcements to closing station identification. Fanfare music into children's chorus, mixing with Indo's **RRI-Merauke**. (Valko, PA/Cumbre)

1108 UTC on 15425

PHILIPPINES: Voice of America relay. *VOA News Now* program discussing United States and China's relations, fair signal quality. (David Ross, Hamilton, Ontario, Canada)

1126 UTC on 4890

PAPUA NEW GUINEA: NBC. Music from Tom Jones followed by a local time check, "26 minutes past 9" at 1126 UTC to "National Broadcasting Corporation" at 1200. (Ross, CAN)

1140 UTC on 9580

AUSTRALIA: Radio. *Life Matters* on the benefits of socializing. (Fraser, MA; McGuire, MD)

1150 UTC on 18960

SWEDEN: Radio. *Money Matters* program on economics. (Fraser, MA) 0200-9495. (McGuire, MD; Frank Hillton, Charleston, SC)

1200 UTC on 15240

NORTHERN MARIANAS: Voice of America relay. *VOA News Now* in progress at tune-in to Summary of World News, good quality. (Ross, CAN)

1400 UTC on 15575

CYPRUS: BBC World Service relay. World news covering African and Middle East topics, fair quality. (Ross, CAN)

1430 UTC on 17525

SLOVAKIA: Adventist World Radio. Interval signal to sign-on identification. Newscast into religious programming. (Ross, CAN)

1505 UTC on 15205

GREECE: Voice Of America relay. Report and interviews on the India-Pakistan nuclear arms discussion. (Fraser, MA)

1557 UTC on 15100.84

PAKISTAN: Radio. Interval signal, signal pause, peppy instrumental music. Station ID, fanfare into English newscast. Would have been a nice signal except for interference from 15105. (Valko, PA)

1613 UTC on 17850

FRANCE: Radio France Int'l. Sports wrap-up segment, SIO=343. (Frodge, MI) 1632-17605// *Arts in France* on reggae music. (Fraser, MA)

1809 UTC on 11990

KUWAIT: Radio. *Islam-Religion of Truth, Rights & Justice* segment to 1815. *Personalities & Culture of Kuwait* to pop music program. Station identification between program segments. (Frodge, MI) 0305-11675 regional news and feature on Israel. (McGuire, MD) 0507-15110 with discussion on Arabic music, fair-good signal quality. (Salmani, CAN/HCDX)

1941 UTC on 21815

COSTA RICA: Radio for Peace Int'l. *Making Contact* program on Colombian drug trade. Station ID 1945 during program pause. SIO=153, // 15048.9. (Frodge, MI)

2022 UTC on 17580

GERMANY: Swiss Radio Int'l relay. *Swiss Sceneshow* with letterbox segment. Info on SRI schedule and program shuffling to ID. German service 2030. (Frodge, MI)

2157 UTC on 10000

PERU: Radio Fuego. Spanish. Local ads with echo effects, lots of cumbian music. Station ID, "esta escuchando Radio Fuego, 104.7 FM," at 2215 "el mejor equipo de Radio Fuego... todos los fines de semana." Station ID jingles at 2229, time check, "35 minutos para las 6 de la tarde," to phone chats. Clear ID repeats several times, station heard only on USB, SINPO=33443. (Gabriel Ivan Barrera, Argentina/Cumbre DX)

2212 UTC on 13640

TURKEY: Voice of. *The Chosen Land* program's focus on scuba diving and sailing. (Fraser, MA; Hilton, SC)

2120 UTC on 7415

USA: WBCC. *Jean Shepard Show* to ID spots 2129-2130. Item on *Genesis Project* to classic rock music segment, SIO+554. (Frodge, MI)

2212 UTC on 7125

GUINEA: Radio Guinienne. French. Station correspondent report to occasional bumper music. Local items 2235 including names, phone numbers. Music segments 2252-2257+, "Guinee" once to "RG" identification as signal steadily improved. (Frodge, MI) 0605-7125 very good reception for French programming. (Salmani, CAN/HCDX)

2234 UTC on 4770

NIGERIA: Radio Nigeria/Kaduna. Jazz music program to 2259, followed by national anthem and sign-off identification. (Ross, CAN) **Voice of Nigeria** 0604-7255, very good signal quality at tune-in. (Salmani, CAN/HCDX)

2300 UTC on 5990

CHINA: China Radio Int'l. Interval signal to station ID. World news, including focus on Vietnam and Yugoslavia, jamming interference noted. (McGuire, MD)

Thanks to our contributors — Have you sent in YOUR logs?

Send to **Gayle Van Horn**, c/o *Monitoring Times* (or e-mail gayle@webworkz.com)

English broadcast unless otherwise noted.

South American website directory

Now that winter DX is here, and you're raking in the new stations, consider the following South American websites. Most websites are Spanish or Portuguese, and contain links for Real or Archived Audio, email reporting and station information. Special thanks to Dave White for his confirmation of current websites.

For postal suggestions and reporting formats please refer to this month's *South American QSL Address Guide*. Good luck on your south of the border trek!

ARGENTINA

(Buenos Aires AM & FM stations that are carried on various shortwave feeder frequencies)

Radio Rivadavia <www.rivadavia.sion.com>

Radio Continental <www.continental.com.ar>

Radio Diez <www.radio10am.com.ar>

BOLIVIA

Radio Mosoj Chaski <<http://tunari.socs.uts.edu.ou/rmc>>

Radio Panamericana <www.panamericana-bolivia.com>

Radio PIO XII <www.caritas.se/radiopio>

BRAZIL

Rádio Bras/Rádio Nacional Amazonia <www.radiobras.gov.br>

Rádio Anhanguera <www2.opopular.com.br/radio.htm>

Rádio Bandeirantes <www.radiobandeirantes.com.br>

Rádio Canção Nova <www.cancaonova.org.br/>

Rádio Clube de Ribeirão Preto <www.clube.com.br/>

Rádio Cultura <www.tvcultura.com.br>

Rádio Cultura Araquara <www.techs.com.br/cultura>

Rádio Cultura São Paulo <www.tvcultura.com.br/>

Rádio Difusora Poços Caldas <www.pocos-net.com.br/difusora/>

Rádio Educadora <www.educadora.com.br>

Rádio Gazeta <www.radiogazeta.com.br>

Rádio Globo <www.radioglobal.com.br>

Rádio Guabi <www.cpovo.net/radio>

Rádio Guarani <www.guarani.com.br/index.html>

Rádio Itatiaia <www.itatiaia.com.br>

Rádio Liberal <www.radioliberal.com.br>

Rádio Marumby <www.gmuh.com.br/aradio.htm>

Rádio Mundial <www.radiomundial.com.br>

Rádio Record <www.rederecord.com.br/radio>

Rádio Ribeirão Preto <www.clube.com.br>

Rádio Trans Mundial <www.transmundial.com.br/>

Sistema Lbv Mundial <www.lbv.org>

CHILE

Rádio Voz Cristiana <www.vozcristiana.com>

PARAGUAY

Rádio Guairá <<http://demasiado.com/radioguairá>>

PERU

Rádio Comas <http://homepages.go.com/homepages/i/a/d/radio_cantagrande/>

Rádio La Oroya <<http://come.to/RadiolaOroya>>

Rádio Luz y Sonido <www.hys.com.pe/page/luzysonido/>

Rádio Santa Rosa <www.viaexpresa.com.pe/santarosa>

URUGUAY

SODRE <www.sodre.gub.uy>

ALBANIA

Radio Tirana International, 7160 kHz. Full data card unsigned. Received in 71 days for an English report and two IRCs. Station address: External Service, Rruga Ismail Qemali Nr. 11, Tirana, Albania. (Ken Maltz, Syosset, NY)

ARGENTINA

Radiodifusión Argentina al Exterior/RAE, 11710 kHz. Full data RAE logo card unsigned, plus tourisit brochure. Received in 58 days for an English report, mint stamps and two souvenir postcards. Station address: Casilla de Correos 555, Correo Central, 1000 Buenos Aires, Argentina. (Sam Wright, Biloxi, MS)

BOLIVIA

La Cruz del Sur, 4875 kHz. No data Spanish reply on station letterhead, signed by Reyes Baltazar Quisepe-Director. Received in seven weeks for a Spanish report, one U.S. dollar and souvenir postcard. Station address: Casilla 1408, La Paz, Bolivia. (Tom Banks, Dallas, TX)

Radio Emisora Malluka (ex. Radio A.N.D.E.S.). Nice long letter from E. Freddy Mamani Machaca-Jefe de prensa y programación. Letter included details about the station, programming and the local area, plus a photograph of *Hotel de Sal*, a rather lonely looking building in the middle of what appears to be a dry salt lake. Received in just under three months for a Spanish report, one U.S. dollar and a souvenir postcard. Station address: La Voz de los Trabajadores Campesino del Altiplano, Casilla 16, Uyuni, Potos, Bolivia. (Richard Jary, Australia/Cumbre DX)

Radio Santa Cruz, 6135 kHz. Personal Spanish reply on station letterhead, signed by P. Francisco Flores, SJ, Director General. Received in 26 days for a Spanish report, five U.S. dollars, packet of pumpkin seeds, Christmas ornament and ten U.S. stamps. Station address: Casilla 672, Santa Cruz, Bolivia. (George Glotzbach, NM/Cumbre DX) *Pumpkin seeds?! Now that's a new one!*

Radio Yura, 4716.8 kHz. Email reception report verified via email from Mr. Rolando Cueto F. <canal18@cedro.pts.entelnet.bo> in four days. Station address: Yura, Provincia Quijarro, Departamento de Potosi, Bolivia. (Daniele Canonico, Muggio, Switzerland)

BRAZIL

Emissora Rural-A Voz do São Francisco, 4945 kHz. Full data station card signed by Lourinaldo Cavalcanti Andrade, plus station sticker. Received in two months for a Portuguese follow-up report and two mint stamps. Station address: Caixa Postal 8, 56300-000 Petrolina, Pernambuco, Brasil. (Frank Hillton, Charleston, SC)

Rádio Cultura São Paulo, 9615 kHz. Partial data verification on station letterhead, with illegible signature. Received in six weeks for a Portuguese report, two mint stamps, tourist brochures, and an address label (used for reply). Station address: Rua Cenno Sbrighi 378, 05099-900 São Paulo, São Paulo, Brasil. (Duane Hadley, Bristol, TN)

Rádio Gaucha, 11915 kHz. Full data station logo card unsigned, plus a station info sheet. Received in two weeks for a Portuguese follow-up report, and two mint stamps. Station address: Avenida Ipiranga 1075 2º andar, Azenha, 90169-900 Porto Alegre Rio Grande Do Sul, Brasil. (Hadley, TN)

CHILE

Radio Esperanza, 6090 kHz. Full data QSL card, transmission guide and personal letter. Received in 48 days for a Spanish report, one U.S. dollar. Station address: Casilla 830, Temuco, Chile. (Manuel Mendez, Spain/Cumbre DX)

MEDIUM WAVE

KSDP, 830 kHz AM. Full data QSL card, plus personal letter from Ronald Schoedel III-General Manager, along with my prepared AM QSL form letter confirmed, 'fridge magnet, and sticker. Station noted as 1kW. Verie signer is a DXer and welcomes reports, and is currently "clearing the files" of all unanswered reports. Station address: Aleutian Peninsula Broadcasting Inc., P.O. Box 328, San Point, AK 99661 USA. Alaska QSL # 51. (Patrick Martin, Rancho Mirage, CA)

KTSM, 1380 kHz AM. Friendly letter from Cat Simon-Program Director. Received in eight days after AM follow-up report. Station address: 801 N. Oregon St., El Paso, TX 79902. (Martin, CA)

KTXS, 1460 kHz AM. Full data letter signed by Jim Hilliker-PSA Director, plus coverage map. Received for an AM report. Station address: 903 N. Main St., Salinas, CA 93906. (Martin, CA)

KYCW, 1090 kHz AM. Verification letter signed by Becky Brenner-Operations Manager. Received in eight days for an AM report. Station address: 1000 Dexter Avenue North, Seattle, WA 98108. (Martin, CA)

2NTC, 1701 kHz AM. QSL verification on station letterhead signed by Sid A. Merhi-Director. Station address: 5 Macquarie St., Parramatta, NSW 2150, Australia. Aussie QSL # 86. (Martin, CA)

PERU

Radio Santa Rosa, 6045 kHz. Date only QSL card unsigned. Received in one month for a Spanish report, one U.S. dollar and a souvenir postcard. Email: <santarosa@viaexpresa.com.pe> Station address: Jirón Camaná 170, Casilla 4451, Lima 1, Peru. (Jary, AUS/Cumbre DX)

SEYCHELLES

FEBA Radio, 15535 kHz. Full data card signed by Doreen Dugathe-QSL Secretary. Received in 102 days for an online reception report at: <www.febo.org.uk>. Email reply that my report was being forwarded to the Seychelles FEBA office. Station address: P.O. Box 234, Mahé, Seychelles, Indian Ocean. (Randy Stewart, Battlefield, MO)

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<input type="checkbox"/>	ICF-SW7600G	RCV 11	\$169.95

AOR

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SANGEAN

<input type="checkbox"/>	ATS-505	RCV 4	\$129.95
<input type="checkbox"/>	ATS-909	RCV 8	\$245.95

WiNRADiO

<input type="checkbox"/>	WR-1550 (External)	RCV 47-E	\$549.95
<input type="checkbox"/>	WR-1550 (Internal)	RCV 47-I	\$499.95
<input type="checkbox"/>	WR-3150 (External)	RCV 48-E	\$1849.95
<input type="checkbox"/>	WR-3150 (Internal)	RCV 48-I	\$1849.95
<input type="checkbox"/>	WR-3500 (External)	RCV 49-E	\$2395.95
<input type="checkbox"/>	WR-3500 (Internal)	RCV 49-I	\$2395.95
<input type="checkbox"/>	WR-3700 (External)	RCV 50-E	\$2895.95
<input type="checkbox"/>	WR-3700 (Internal)	RCV 50-I	\$2895.95

GRUNDIG

<input type="checkbox"/>	Satellit 800	RCV 33	\$514.95*
<input type="checkbox"/>	Yacht Boy 400 PE	RCV 22	\$184.95

DRAKE

<input type="checkbox"/>	R8-B	RCV 3	\$1159.95*
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JAPAN RADIO COMPANY

<input type="checkbox"/>	NRD-545	RCV 21	\$1799.95
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GE

<input type="checkbox"/>	SUPERADIO III	RCV 5	\$59.95
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PALSTAR

<input type="checkbox"/>	R30	RCV 18	\$495.95
<input type="checkbox"/>	R30 w/Collins filter	RCV 18C	\$549.95

ANTENNAS

<input type="checkbox"/>	Active Duck	ANT 36	\$49.95
<input type="checkbox"/>	Grove Skywire	ANT 2	\$39.95
<input type="checkbox"/>	H800 Skymatch	ANT 15	\$129.95*
<input type="checkbox"/>	Select-A-Tenna	ANT 21	\$59.95
<input type="checkbox"/>	Super Select-A-Tenna	ANT 40	\$189.95
<input type="checkbox"/>	Sony AN-LP1	ANT 26	\$89.95
<input type="checkbox"/>	Stoner-Dymek		
	DA100E	ANT 24	\$184.95
<input type="checkbox"/>	Universal Reel	ANT 16	\$14.95
<input type="checkbox"/>	AOR SA-7000 Super Wide		
	Receiving Antenna	ANT 39	\$189.95

Shipping/Handling Charges

Total Order	Shipping Charges
\$1-\$99	\$5.95
\$100-\$399	\$7.95
\$400-\$899	\$11.95
\$900-\$1499	\$15.95
\$1500-\$1999	\$19.95
\$2000-\$2499	\$23.95
\$2500+	\$27.95

*price includes shipping within the US

Grove Enterprises, Inc.
(800) 438-8155; (828) 837-9200
(828) 837-2216 fax
7540 Hwy 64 W; Brasstown, NC 28902
order@grove-ent.com
www.grove-ent.com

HOW TO USE THE SHORTWAVE GUIDE

0000-0100 twhfa USA, Voice of America 5995am 6130ca 7405am 9455af
① ② ⑤ ③ ④ ⑥ ⑦

Convert your time to UTC.

Broadcast time on Å and time off Å are expressed in Coordinated Universal Time (UTC) – the time at the 0 meridian near Greenwich, England. To translate your local time into UTC, first convert your local time to 24-hour format, then add (during Standard Time) 5, 6, 7, or 8 hours for Eastern, Central, Mountain or Pacific Times, respectively. Eastern, Central, and Pacific Times are already converted to UTC for you at the top of each page.

Note that all *dates*, as well as times, are in UTC; for example, a show which might air at 0030 UTC *Sunday* will be heard on *Saturday* evening in America (in other words, 7:30 pm Eastern, 6:30 pm Central, etc.).

Find the station you want to hear.

Look at the page which corresponds to the time you will be listening. On the top half of the page English broadcasts are listed by UTC time on Å, then alphabetically by country Å, followed by the station name Å. (If the station name is the same as the country, we don't repeat it, e.g., "Vanuatu, Radio" [Vanuatu].)

If a broadcast is not *daily*, the days of broadcast Å will appear in the column following the time of broadcast, using the following codes:

Day Codes

s Sunday
m Monday
t Tuesday
w Wednesday
h Thursday
f Friday
a Saturday
mon monthly

In the same column Å, irregular broadcasts are indicated "tent" and programming which includes languages besides English are coded "vl" (various languages).

Choose the most promising frequencies for the time, location and conditions.

The frequencies Å follow to the right of the station listing; all frequencies are listed in kilohertz (kHz). Not all listed stations will be heard from your location and virtually none of them will be heard all the time on all frequencies.

Shortwave broadcast stations change some of their frequencies at least twice a year, in April and October, to adapt to seasonal conditions. But they can also change in response to short-term conditions, interference, equipment problems, etc. Our frequency manager coordinates published station schedules with confirmations and reports from her monitoring

team and MT readers to make the Shortwave Guide up-to-date as of one week before publication.

To help you find the most promising signal for your location, immediately following each frequency we've included information on the target area ÅE of the broadcast. Signals beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible.

Target Areas

af: Africa
al: alternate frequency (occasional use only)
am: The Americas
as: Asia
au: Australia
ca: Central America
do: domestic broadcast
eu: Europe
me: Middle East
na: North America
om: omnidirectional
pa: Pacific
sa: South America
va: various

Consult the propagation charts.

To further help you find a strong signal, we've included a chart on page 64 which takes into account conditions affecting the audibility of shortwave broadcasts. Simply pick out the section of the chart for the region in which you live and find the line for the region in which the station you want to hear is located. The chart indicates the optimum frequencies (in megahertz-MHz) for a given time in UTC. (Users outside North America can use the same procedure in reverse to find best reception from North America.)

Choose a program or station you want to hear.

Some selected programs appear on the lower half of the page for prime listening hours – space does not permit 24-hour listings. Our program manager changes the stations and programming featured each month to reflect the variety available on shortwave, though BBC programs are almost always included.

Occasionally program listings will be followed by "See X 0000." This information indicates that the program is a rerun, and refers to a previous summary of the program's content. The capital letter stands for a day of the week, using the same day codes as in the frequency listing (see above), and the four digits represent a time in UTC.

MT MONITORING TEAM

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PROGRAM HIGHLIGHTS

JOHN FIGLIOZZI

New Programs from RCI

Radio Canada International has introduced new weekday and weekend programs.

Weekdays: *Canada Today* is broadcast "live" throughout the day (0500, 0600, 1500, 1630, 1800, 2100, 0200) and hosted, depending on edition, by Lynn Desjardins, David Blair or Jim Craig. *Canada Today* replaces *Spectrum*, which was taped as one daily program for all regions, and includes a longer newscast, more correspondents' reports as well as business, sports and a daily press review. It is designed to accommodate more immediate and up-to-the-minute content than was possible under *Spectrum's* old format.

Weekends: *Canada Review* (A 1530, 1830, 2130 S 0230; S 1500, 1800, 2100, M 0200) has replaced RCI's former weekend programs like *Venture Canada* and *Arts Canada* with a more general magazine style production that will incorporate some of the elements of those single topic programs, as well as other material reflecting Canadian lifestyles and attitudes. *Canada Newsweek* (A 0500, 0600, 1500, 1630, 1800, 2100, S 0200) looks back at the last seven days.

RCI continues to broadcast popular CBC programs such as *As It Happens*, *Sunday Edition*, *Global Village* and *Quirks and Quarks* for its international audience. RCI's *Maple Leaf Mailbag* also continues in its regular slots (S 0530, 0600, 1530, 1630, 1830, 2130, M 0230).

Consolidated BBCWS Schedules

This month, we attempt to untangle for you the enigma that is the program schedules of the **BBC World Service**.

Seasonal time changes seem to set off a semi-annual scramble making BBC schedules a lot like Forrest Gump's box of chocolates – you never know what you're going to get. Some programs undergo a one-hour adjustment that appears designed to keep a program at the same local time in the target area. But there are also other seemingly incongruous changes and some programs just stay where they are relative to UTC. This inconsistent approach makes it harder for the listener to be sure of what's on when, hardly an inspiration to loyalty.



FREQUENCIES

0000	0100		Anguilla, Caribbean Beacon	6090am								15280as	15310as	15360as	17615as
0000	0100	vl	Australia, ABC/Alice Springs	4835do								17790as			
0000	0100		Australia, ABC/Katherine	5025do					0000	0100	as	UK, Global Kitchen/Merlin	3955eu	6180eu	7165eu
0000	0100	vl	Australia, ABC/Tennant Creek	4910do					0000	0100	f	UK, Global Kitchen/Merlin	6170eu		
0000	0100		Australia, Christian Voice	9875va	15165va	17645va	21680va		0000	0100		USA, Armed Forces Radio	4278va	4319va	4993va
0000	0100		Australia, Radio	9660pa	12080va	15240pa	17580pa					6350va	6458va	6847va	10320va
				17750as	17795va	21740va						10940va	12579va	12689va	13362va
				7400na	9400na							16847va			
0000	0100		Bulgaria, Radio	11940as					0000	0100		USA, KAIJ Dallas TX	5755va		
0000	0015		Cambodia, National Radio Of	9625do					0000	0100		USA, KTBN Salt Lake City UT	7510na		
0000	0100		Canada, CFRX Toronto ON	6070do					0000	0100		USA, KWHR Naalehu HI	17510as		
0000	0100		Canada, CFVP Calgary AB	6030do					0000	0030		USA, Voice of America	7215as	9770as	11760as
0000	0100		Canada, CKZN St John's NF	6160do								15290as	17735as	17820as	15185as
0000	0100		Canada, CKZU Vancouver BC	6160do					0000	0100	twfha	USA, Voice of America	5995am	6130ca	7405am
0000	0100		Costa Rica, R for Peace Intl	21815va								9775am	11695ca	13740am	9455af
0000	0100	mtwhf	Costa Rica, R for Peace Intl	6970va					0000	0100		USA, WBCQ Monticello ME	7415na	9335na	
0000	0100		Costa Rica, University Network	5030am	6150va	7375na	9725na		0000	0100		USA, WEWN Birmingham AL	5825va	7425na	9355na
				11870va	13749af				0000	0100		USA, WGTG McCaysville GA	5085va	6890am	9320am
				9745na	11840na	21455usb			0000	0100		USA, WHRA Greenbush ME	7580na		
0000	0100		Ecuador, HCJB	9900am					0000	0100		USA, WHRI Noblesville IN	7315sa		
0000	0030		Egypt, Radio Cairo	11690va					0000	0100		USA, WINB Red Lion PA	12160am		
0000	0100	a/monthly	Finland, Scandv Weekend Radio	3289do	5949do				0000	0100		USA, WJCR Upton KY	7490va	13595as	
0000	0100		Guyana, Voice of	7410as	9705as	9950as	11620as		0000	0100		USA, WRMI Miami FL	9955am		
0000	0045		India, All India Radio	13625as					0000	0100		USA, WSHB Cypress Crk SC	9430am		
				6050eu	6145eu	6155af	13650as		0000	0100		USA, WTJC Newport NC	9370na		
				17810as					0000	0100	sm	USA, WWBS Macon GA	11900eu		
0000	0015		Japan, Radio	6280af					0000	0100		USA, WWCR Nashville TN	3215am	5070am	5935am
				7295do					0000	0100		USA, WYFR Okeechobee FL	6085na	9505na	7435am
0000	0100		Liberia, Voice of Hope	5980do					0000	0100	vl	Vanuatu, Radio	3945do	4960do	7260do
0000	0100		Malaysia, Radio	7160do					0000	0100		Zambia, Christian Voice	4965do		
0000	0100		Malaysia, RTM Kota Kinabalu	9705am	11770alt				0015	0100		Japan, Radio	6050eu	6145na	6155eu
0000	0030	vl	Mexico, R Mexico International	3270af	3289af				0030	0100		Iran, VOIRI	6065am	6135na	9022na
0000	0100		Namibia, Namibian BC Corp	6165na	9845na				0030	0100		Kirgiziya, Kirgiziya Radio	4010eu		
0000	0100		Netherlands, Radio	17675pa					0030	0100		Sri Lanka, Sri Lanka BC Corp	4940do	9770	
0000	0100		New Zealand, R New Zealand Int	3935do	7290do				0030	0100		Sri Lanka, Sri Lanka BC Corp	4940do	6005as	6075as
0000	0100		New Zealand, ZLXA	4405va	11460na	11710na	13760na					15425as			9770as
0000	0056		North Korea, R Pyongyang	15180na					0030	0100		Thailand, Radio	15395na		
				9675do	11880do				0030	0100		UK, BBC World Service	5965as	5975na	6175na
0000	0100	vl	Papua New Guinea, NBC	6150do								5910as	5950am	6175na	6195as
0000	0100		Singapore R Corp of Singapore	5020do								12095sa	15280as	15310as	11955as
0000	0100	vl/as	Solomon Islands, SIBC	9545do								17790as		15360as	15360as
0000	0100	vl/a	Solomon Islands, SIBC	6055na					0030	0100		USA, VOA Special English	7215as	9770as	11760as
0000	0100		Spain, R Exterior Espana	9655af	9690af	11905af						15290na	17735pa	11760as	15185as
0000	0030		Thailand, Radio	3915as	5965as	5975na	6175na		0050	0100		Italy, RAI International	6010na	9675na	17820as
0000	0030		UK, BBC World Service	6195as	7110as	9410me	9590am		0050	0100		UK, International BC Tamil	11570as	11800na	
				9915sa	11945as	11955as	12095sa								

SELECTED PROGRAMS

Sundays

0000	BBC (Am)	News Summary
0000	BBC (E As/Pa/Au)	World Briefing
0000	BBC (S As)	World Briefing
0001	BBC (Am)	Play of the Week (contemporary radio drama)
0020	BBC (E As/Pa/Au)	Sports Roundup
0020	BBC (S As)	Sports Roundup
0030	BBC (E As/Pa/Au)	Agenda (contemporary ideas/trends)
0030	BBC (S As)	Agenda (contemporary ideas/trends)

Mondays

0000	BBC (Am)	World Briefing
0000	BBC (E As/Pa/Au)	World Briefing
0000	BBC (S As)	World Briefing
0020	BBC (Am)	Sports Roundup
0020	BBC (E As/Pa/Au)	Sports Roundup
0020	BBC (S As)	Sports Roundup
0030	BBC (Am)	The World Today (international news/analysis)
0030	BBC (E As/Pa/Au)	World Business Review (the week's financial news)
0030	BBC (S As)	The World Today (international news/analysis)
0045	BBC (E As/Pa/Au)	Letter from America (commentary by Alistair Cooke)

Tuesdays

0000	BBC (Am)	News
0000	BBC (E As/Pa/Au)	World Briefing
0000	BBC (S As)	World Briefing
0005	BBC (Am)	Outlook (topical magazine)
0020	BBC (E As/Pa/Au)	Sports Roundup
0020	BBC (S As)	Sports Roundup
0030	BBC (E As/Pa/Au)	World Business Report
0030	BBC (S As)	The World Today (international news/analysis)
0045	BBC (Am)	Patterns of Faith (moral/spiritual reflections)
0045	BBC (E As/Pa/Au)	Analysis (of a current event/issue)

Wednesdays

0000	BBC (Am)	News
0000	BBC (E As/Pa/Au)	World Briefing
0000	BBC (S As)	World Briefing
0005	BBC (Am)	Outlook (topical magazine)
0020	BBC (E As/Pa/Au)	Sports Roundup
0020	BBC (S As)	Sports Roundup
0030	BBC (E As/Pa/Au)	World Business Report
0030	BBC (S As)	The World Today (international news/analysis)
0045	BBC (Am)	Plain English (on language)
0045	BBC (E As/Pa/Au)	Analysis (of a current event/issue)

Thursdays

0000	BBC (Am)	News
0000	BBC (E As/Pa/Au)	World Briefing
0000	BBC (S As)	World Briefing
0005	BBC (Am)	Outlook (topical magazine)
0020	BBC (E As/Pa/Au)	Sports Roundup
0020	BBC (S As)	Sports Roundup
0030	BBC (E As/Pa/Au)	World Business Report
0030	BBC (S As)	The World Today (international news/analysis)
0045	BBC (Am)	Heart and Soul (questions on faith/religion)
0045	BBC (E As/Pa/Au)	From Our Own Correspondent (backround to the news)

Fridays

0000	BBC (Am)	News
0000	BBC (E As/Pa/Au)	World Briefing
0000	BBC (S As)	World Briefing
0005	BBC (Am)	Outlook (topical magazine)
0020	BBC (E As/Pa/Au)	Sports Roundup
0020	BBC (S As)	Sports Roundup
0030	BBC (E As/Pa/Au)	World Business Report
0030	BBC (S As)	The World Today (international news/analysis)
0045	BBC (Am)	Best of 'The Edge' (youth magazine)
0045	BBC (E As/Pa/Au)	Analysis (of a current event/issue)

Saturdays

0000	BBC (Am)	News
0000	BBC (E As/Pa/Au)	World Briefing
0000	BBC (S As)	World Briefing
0005	BBC (Am)	Outlook (topical magazine)
0020	BBC (E As/Pa/Au)	Sports Roundup
0020	BBC (S As)	Sports Roundup
0030	BBC (E As/Pa/Au)	World Business Report
0030	BBC (S As)	Science in Action (topical research reports)
0045	BBC (Am)	Body and Mind (health/menience)
0045	BBC (E As/Pa/Au)	Analysis (of a current event/issue)

Hauser's Highlights

ECUADOR: HCJB

B-00 English:
0000-0400 9745 100 351 N. Amer. (E)
0000-1530 21455 1 35/225 Eur./S. Pac.
0000-0700 11840 50 330 N. America
0400-0700 9745 100 325 N Amer. (W)
0700-0900 9780 250 34 Europe
0700-1100 11755 100 228 S. Pacific
1100-1630 12005 50 43 Caribbean
1100-1630 15115 100 160/353 N/S America
1900-2200 17660 100 41 Europe
(HCJB via BC-DX)



FREQUENCIES

0100 0200	Anguilla, Caribbean Beacon	6090am			
0100 0200 vl	Australia, ABC/Katherine	5025do			
0100 0200 vl	Australia, ABC/Tennant Creek	4910do			
0100 0200	Australia, Christian Voice	9875va	15165va	17645va	21680va
0100 0200	Australia, Radio	9660pa	12080va	15240pa	15415as
		17580pa	17750as	17795va	21725pa
0100 0200	Canada, CBC Northern Service	9625do			
0100 0200	Canada, CFRX Toronto ON	6070do			
0100 0200	Canada, CFVP Calgary AB	6030do			
0100 0200	Canada, CKZN St John's NF	6160do			
0100 0200	Canada, CKZU Vancouver BC	6160do			
0100 0130	Canada, R Canada International	5960am	9755am	11715am	13670am
		15170am	15305am		
0100 0156	China, China Radio International	9570na			
0100 0200	Costa Rica, R for Peace Intl	21815va			
0100 0200	Costa Rica, R for Peace Intl	6970va			
0100 0200	Costa Rica, University Network	5030am	6150va	7375na	9725na
		11870va	13749af		
0100 0200	Cuba, Radio Havana	6000na	9820na	11705na	
0100 0127	Czech Rep, Radio Prague Intl	6200na	7345na		
0100 0200	Ecuador, HCJB	9745na	11840na	21455usb	
0100 0130 a/monthly	Finland, Scandv Weekend Radio	11690va			
0100 0115	Finland, YLE/R Finland	11985na	13770na		
0100 0145	Germany, Deutsche Welle	6040am	6145na	9640am	9700na
		9765na			
0100 0130 s	Germany, Universal Life	9435as			
0100 0200	Guyana, Voice of	3289do	5949do		
0100 0200	Indonesia, Voice of	9525va	11785va	15149va	
0100 0127	Iran, VOIRI	6065am	6135na	9022na	
0100 0110	Italy, RAI International	6010na	9675na	11800na	
0100 0200	Japan, Radio	9515me	11860as	11870me	15325as
		15590as	17685pa	17835sa	17845pa
0100 0200	Liberia, Voice of Hope	6280af			
0100 0200	Malaysia, Radio	7295do			
0100 0200	Malaysia, RTM Kota Kinabalu	5980do			
0100 0200	Namibia, Namibian BC Corp	3270af	3289af		
0100 0125	Netherlands, Radio	6165na	9845na		
0100 0200	New Zealand, R New Zealand Int	17675pa			
0100 0200	New Zealand, ZLXA	3935do	7290do		
0100 0156	North Korea, R Pyongyang	3560va	11735va	15229va	17734va
0100 0200 vl	Papua New Guinea, NBC	9675do	11880do		
0100 0200	Singapore R Corp of Singapore	6150do			
0100 0130	Slovakia, R Slovakia International	5930na	7230ca	9440sa	
0100 0200 vl/as	Solomon Islands, SIBC	5020do			
0100 0200 vl/a	Solomon Islands, SIBC	9545do			
0100 0200	Spain, R Exterior Espana	6055na			
0100 0200	Sri Lanka, Sri Lanka BC Corp	4940do	6005as	6075as	9770as
		15425as			
0100 0200	Switzerland, Swiss R International	9905am			
0100 0200	UK, BBC World Service	5965as	5975na	6175na	6195as
		9410me	9590am	9915sa	11955as
		12095sa	15280as	15310as	15360as
		17790as			
0100 0200 as	UK, Global Kitchen/Merlin	3955eu	6180eu	7165eu	
0100 0200	Ukraine, R Ukraine International	7450va	9610va	9810va	11840va
0100 0200	USA, Armed Forces Radio	4278va	4319va	4993va	5765va
		6350va	6458va	6847va	10320va
		10940va	12579va	12689va	13362va
		16847va			
0100 0200	USA, KAIJ Dallas TX	5755va			
0100 0200	USA, KTBN Salt Lake City UT	7510na			
0100 0200	USA, KWHR Naalehu HI	17510as			
0100 0130 twfha	USA, Voice of America	5995am	6130ca	7405am	9455af
		9775am	13740am		
0100 0200	USA, Voice of America	7115as	9635as	11705as	11725as
		11820as	13650as	15250as	17740as
		17820as			
0100 0200	USA, WBCQ Monticello ME	7415na	9335na		
0100 0200	USA, WEWN Birmingham AL	5825na	7425na	9355na	
0100 0200	USA, WGTG McCaysville GA	5085va	6890am	9320am	
0100 0200	USA, WHRA Greenbush ME	7580na			
0100 0200	USA, WHRI Noblesville IN	7315sa			
0100 0200	USA, WINB Red Lion PA	12160am			
0100 0200	USA, WJCR Upton KY	7490va	13595as		
0100 0200	USA, WRMI Miami FL	9955am			
0100 0200	USA, WSHB Cypress Crk SC	9430na			
0100 0200	USA, WTJC Newport NC	9370na			
0100 0200 sm	USA, WWBS Macon GA	11900eu			
0100 0200	USA, WWCR Nashville TN	3215am	5070am	5935am	7435am
0100 0200	USA, WYFR Okeechobee FL	6065na	15165as		
0100 0130	Uzbekistan, Radio Tashkent	7190as	9375as	9530as	9715as
0100 0200 vl	Vanuatu, Radio	3945do	4960do	7260do	
0100 0127	Vietnam, Voice of	7250na	9695na		
0100 0200	Zambia, Christian Voice	4965do			
0130 0200	Albania, R Tirana International	6115na	7160na		
0130 0200	Austria, R Austria International	9655na	9870am	13730am	
0130 0159	Canada, R Canada International	5960am	9755am		
0130 0159 sm	Canada, R Canada International	11715am	13670am	15305am	
0130 0200 a/monthly	Finland, Scandv Weekend Radio	11720va			
0130 0145 vl	Libya, Voice of Africa	11815af	17725af		
0130 0200	Lithuania, Radio Vilnius	6120na			
0130 0200	Slovakia, Adventist World Radio	11600as			
0130 0200	Sweden, Radio	9495va			
0130 0200	UK, RTE Radio	6155am			
0130 0200 twfha	USA, VOA Special English	7405am	9775am	13740am	
0130 0200 twfha	USA, Voice of America	5995am	6130ca	9455af	
0140 0200	Vatican City, Vatican Radio	9650au	12055au		

SELECTED PROGRAMS

Sundays

0100 BBC (Am)	The World Today (international news/analysis)
0100 BBC (E As/Pa/Au)	The World Today (international news/analysis)
0100 BBC (S As)	The World Today (international news/analysis)
0130 BBC (Am)	Reporting Religion
0130 BBC (E As/Pa/Au)	In Praise of God (services of worship)
0130 BBC (S As)	Assignment (a current topical issue)
0145 BBC (Am)	Letter From America (commentary by Alistair Cooke)

Mondays

0100 BBC (Am)	The World Today (international news/analysis)
0100 BBC (E As/Pa/Au)	News
0100 BBC (S As)	The World Today (international news/analysis)
0105 BBC (E As/Pa/Au)	Talking Point (global current affairs phone-in)
0145 BBC (E As/Pa/Au)	Off the Shelf (serialized book readings)

Tuesdays

0100 BBC (Am)	News
0100 BBC (E As/Pa/Au)	News
0100 BBC (S As)	The World Today (international news/analysis)
0105 BBC (Am)	Meridian-Ideas (cultural trends/thought)
0105 BBC (E As/Pa/Au)	Outlook (topical magazine)
0130 BBC (Am)	Music Mix (showcasing popular music genres)
0145 BBC (E As/Pa/Au)	Off the Shelf (serialized book readings)

Wednesdays

0100 BBC (Am)	News
0100 BBC (E As/Pa/Au)	News
0100 BBC (S As)	The World Today (international news/analysis)
0105 BBC (Am)	Meridian-Screen (international film/cinema)
0105 BBC (E As/Pa/Au)	Outlook (topical magazine)
0130 BBC (Am)	UK Top 20 (British top hits)

0145 BBC (E As/Pa/Au) Off the Shelf (serialized book readings)

Thursdays

0100 BBC (Am)	News
0100 BBC (E As/Pa/Au)	News
0100 BBC (S As)	The World Today (international news/analysis)
0105 BBC (Am)	Meridian-Music (classical music trends)
0105 BBC (E As/Pa/Au)	Outlook (topical magazine)
0130 BBC (Am)	Westway (drama serial)
0145 BBC (Am)	UK Album Chart (top selling British CDs)
0145 BBC (E As/Pa/Au)	Off the Shelf (serialized book readings)

Fridays

0100 BBC (Am)	News
0100 BBC (E As/Pa/Au)	News
0100 BBC (S As)	The World Today (international news/analysis)
0105 BBC (Am)	Meridian-Writing (examining contemporary literature)
0105 BBC (E As/Pa/Au)	Outlook (topical magazine)
0130 BBC (Am)	World Music (showcasing global music trends)
0145 BBC (E As/Pa/Au)	Off the Shelf (serialized book readings)

Saturdays

0100 BBC (Am)	News
0100 BBC (E As/Pa/Au)	News
0100 BBC (S As)	The World Today (international news/analysis)
0105 BBC (Am)	Meridian-Masterpiece (showcasing best performances)
0105 BBC (E As/Pa/Au)	Outlook (topical magazine)
0130 BBC (Am)	Westway (drama serial)
0130 BBC (S As)	People and Politics (the week in Parliament)
0145 BBC (Am)	Music X-Press (trend-setting popular music)
0145 BBC (E As/Pa/Au)	Waveguide (international broadcasting report) [monthly]
0145 BBC (E As/Pa/Au)	Write On (listener letters/comments) [exc. one wk.]

Hauser's Highlights

CZECH REPUBLIC: R. Prague

B-00 English to NAM:
1400-1429 21745 100
2100-2127 5930 200
2230-2257 7345 100
2330-2357 7345 100
9435 100
0100-0127 6200 100
7345 200
0200-0227 6200 100
7345 200
0400-0427 7345 200
** 7385 50
9435 100

Transmitters at Litomysl. 16E10 49N48; ** Relayed via WRMI Miami, Florida 80W22 25N54. Live via Internet <http://www.radio.cz> (via Kai Ludwig, DXLD) Note that 21745 is back at 1400, the well-received B-season-only service (gh)



FREQUENCIES

0200 0300	Anguilla, Caribbean Beacon	6090am			
0200 0300	Argentina, RAE	11710am			
0200 0300	Australia, ABC/Alice Springs	4835do			
0200 0300	Australia, ABC/Katherine	5025do			
0200 0300	Australia, ABC/Tennant Creek	4910do			
0200 0300	Australia, Christian Voice	9865va	15185va	17645va	21680va
0200 0300	Australia, Radio	9660pa	12080va	15240pa	15415as
		15515va	17580pa	17750as	21725pa
0200 0210	Bangladesh, Bangla Betar	4882as			
0200 1215	Cambodia, National Radio Of	11940as			
0200 0300	Canada, CBC Northern Service	9625do			
0200 0300	Canada, CFRX Toronto ON	6070do			
0200 0300	Canada, CFVP Calgary AB	6030do			
0200 0300	Canada, CKZN St John's NF	6160do			
0200 0300	Canada, CKZU Vancouver BC	6160do			
0200 0229	Canada, R Canada International	9755am	11715am	13670am	15170am
		15305am			
0200 0300	Costa Rica, R for Peace Intl	21815va			
0200 0300	Costa Rica, R for Peace Intl	6970va			
0200 0300	Costa Rica, University Network	5030am	6150va	7375na	9725na
		11870va	13749af		
0200 0300	Cuba, Radio Havana	6000na	9820na	11705na	
0200 0227	Czech Rep, Radio Prague Intl	6200na	7345na		
0200 0300	Ecuador, HCJB	9745na	11840na	21455usb	
0200 0300	Egypt, Radio Cairo	9475am			
0200 0300	Finland, Scandv Weekend Radio	11720va			
0200 0245	Germany, Deutsche Welle	7285as	9615as	9765as	11965as
0200 0210	Greece, Voice of	7450va	9420va	12110va	15630va
0200 0300	Guyana, Voice of	3289do	5949do		
0200 0230	Hungary, Radio Budapest	9835na			
0200 0300	Kenya, Kenya BC Corp	4935do			
0200 0300	Liberia, Voice of Hope	6280af			
0200 0300	Malaysia, Radio	7295do			
0200 0300	Malaysia, RTM Kota Kinabalu	5980do			
0200 0230	Myanmar, Radio	7185do			
0200 0300	Namibia, Namibian BC Corp	3270af	3289af		
0200 0300	New Zealand, R New Zealand Int	17675pa			
0200 0300	New Zealand, ZLXA	3935do	7290do		
0200 0256	North Korea, R Pyongyang	11844va	13649va		
0200 0300	Papua New Guinea, NBC	9675do	11880do		
0200 0256	Romania, R Romania International	11885as	9510na	9690na	11830na
		17790pa	11940na	15105as	15380pa
0200 0300	Russia, Voice of Russia WS	9665na	11825na	11990na	12045as
		15595na	17595na		
0200 0300	Singapore R Corp of Singapore	6150do			
0200 0300	Solomon Islands, SIBC	5020do			
0200 0300	Solomon Islands, SIBC	9545do			
0200 0300	South Korea, R Korea Intl	7275as	11725sa	11810sa	15575na
0200 0300	Sri Lanka, Sri Lanka BC Corp	6005as	6075as	6130do	9770as
		15425as			
0200 0300	Taiwan, R Taiwan International	5950na	9680na	11740as	11825pa
		15345as			
0200 0300	UK, BBC World Service	5975na	6135am	6175na	6195eu
		9410eu	9770af	9915sa	11760me
		11955as	12095sa	15280as	15310as
		15360as	17790as		
0200 0240 f	UK, Global Kitchen/Merlin	6170eu			
0200 0300	USA, Armed Forces Radio	4278va	4319va	4993va	5765va
		6350va	6458va	6847va	10320va
		10940va	12579va	12689va	13362va
		16847va			
0200 0300	USA, KAIJ Dallas TX	5755va			
0200 0300	USA, KJES Vado NM	7555na			
0200 0300	USA, KTVN Salt Lake City UT	7510na			
0200 0300	USA, KWHR Naalehu HI	17510as			
0200 0300	USA, Voice of America	7115as	9635as	11705as	11725as
		11820as	13650as	15250as	17740as
		17820as			
0200 0300	USA, WBCQ Monticello ME	7415na	9335na		
0200 0300	USA, WEWN Birmingham AL	5825va	7425na		
0200 0300	USA, WGTG McCaysville GA	5085va	6890am		
0200 0300	USA, WHRA Greenbush ME	7580na			
0200 0300	USA, WHRI Noblesville IN	7315sa			
0200 0300	USA, WINB Red Lion PA	12160am			
0200 0300	USA, WJCR Upton KY	7490va	13595as		
0200 0300	USA, WRMI Miami FL	7385am			
0200 0300	USA, WSHB Cypress Crk SC	9430na	7535na		
0200 0300	USA, WTJC Newport NC	9370na			
0200 0300	USA, WWCR Nashville TN	3215am	5070am	5935am	7435am
0200 0300	USA, WYFR Okeechobee FL	6065na	9505na		
0200 0300 vl	Vanuatu, Radio	3945do	4960do	7260do	
0200 0300	Zambia, Christian Voice	4965do			
0215 0220	Nepal, Radio	5005as	7165as		
0230 0300	Sweden, Radio	9495na	7155alt		
0230 0300	Switzerland, Swiss R International	9885am	9905am		
0230 0257	Vietnam, Voice of	7250na	9695na		
0250 0300	Vatican City, Vatican Radio	7305am	9605am		
0250 0300 vl	Zambia, National BC Corp	6165do	6265do		
0257 0300 vl	Malawi, Malawi BC Corp	3380do			

SELECTED PROGRAMS

Sundays

0200 BBC (Am)	The World Today (int'l news/analysis)
0200 BBC (E As/Pa/Au)	The World Today (int'l news/analysis)
0200 BBC (ME)	The World Today (int'l news/analysis)
0200 BBC (E Af)	The World Today (int'l news/analysis)
0200 BBC (S As)	The World Today (int'l news/analysis)
0230 BBC (Am)	From Our Own Correspondent (background to the news)
0230 BBC (E As/Pa/Au)	From Our Own Correspondent
0230 BBC (E Af)	From Our Own Correspondent
0230 BBC (ME)	From Our Own Correspondent
0230 BBC (S As)	From Our Own Correspondent

Mondays

0200 BBC (Am)	News
0200 BBC (E As/Pa/Au)	News
0200 BBC (ME)	News
0200 BBC (E Af)	News
0200 BBC (S As)	The World Today (int'l news/analysis)
0205 BBC (Am)	Wright Around the World (pop music/dedications w/ Steve Wright)
0205 BBC (E As/Pa/Au)	Meridian-Ideas (cultural trends/thought)
0205 BBC (ME)	Wright Around the World
0205 BBC (E Af)	Wright Around the World
0230 BBC (E As/Pa/Au)	Music Mix (showcasing popular music genres)

Tuesdays

0200 BBC (Am)	News
0200 BBC (E As/Pa/Au)	News
0200 BBC (ME)	News
0200 BBC (E Af)	News
0200 BBC (S As)	The World Today (int'l news/analysis)
0205 BBC (Am)	Health Matters (medical news/keeping fit)
0205 BBC (E As/Pa/Au)	Meridian-Screen (international film/cinema)
0205 BBC (ME)	Health Matters (medical news/keeping fit)
0205 BBC (E Af)	Health Matters (medical news/keeping fit)
0230 BBC (Am)	Everywoman (international women's magazine)
0230 BBC (E As/Pa/Au)	UK Top 20 (British top hits)
0230 BBC (ME)	Everywoman (international women's magazine)
0230 BBC (E Af)	Everywoman (international women's magazine)

Wednesdays

0200 BBC (Am)	News
0200 BBC (E As/Pa/Au)	News
0200 BBC (ME)	News
0200 BBC (E Af)	News
0200 BBC (S As)	The World Today (international news/analysis)
0205 BBC (Am)	Science View (astronomy/discoveries/computing)
0205 BBC (E As/Pa/Au)	Meridian-Music (classical music trends)
0205 BBC (ME)	Science View (astronomy/discoveries/computing)
0205 BBC (E Af)	Science View (astronomy/discoveries/computing)
0230 BBC (Am)	Focus on Faith (religious issues)
0230 BBC (E As/Pa/Au)	Westway (drama serial)
0230 BBC (ME)	Focus on Faith (religious issues)
0230 BBC (E Af)	Focus on Faith (religious issues)
0245 BBC (E As/Pa/Au)	UK Album Chart (top selling British CDs)

Thursdays

0200 BBC (Am)	News
0200 BBC (E As/Pa/Au)	News
0200 BBC (ME)	News
0200 BBC (E Af)	News
0200 BBC (S As)	The World Today (int'l news/analysis)
0205 BBC (Am)	Focus on Football (global soccer)[1st wk.]
0205 BBC (E As/Pa/Au)	Sports International [exc. 1st wk.]
0205 BBC (ME)	Meridian-Writing (contemporary literature)
0205 BBC (E Af)	Focus on Football (global soccer)[1st wk.]
0205 BBC (Am)	Sports International [exc. 1st wk.]
0205 BBC (E As/Pa/Au)	Focus on Football (global soccer)[1st wk.]
0205 BBC (ME)	Sports International [exc. 1st wk.]
0205 BBC (E Af)	Focus on Football (global soccer)[1st wk.]
0205 BBC (Am)	Sports International [exc. 1st wk.]
0230 BBC (Am)	Pick of the World (World Service highlights)
0230 BBC (E As/Pa/Au)	World Music (showcasing global music trends)
0230 BBC (ME)	Pick of the World (World Service highlights)
0230 BBC (E Af)	Pick of the World (World Service highlights)

Fridays

0200 BBC (Am)	News
0200 BBC (E As/Pa/Au)	News
0200 BBC (ME)	News
0200 BBC (E Af)	News
0200 BBC (S As)	The World Today (int'l news/analysis)

0205 BBC (Am)	One Planet (development & the environment)
0205 BBC (ME)	One Planet (development & the environment)
0205 BBC (E As/Pa/Au)	Meridian-Masterpiece (best performances)
0205 BBC (E Af)	One Planet (development & the environment)
0230 BBC (Am)	People and Places (forum for global views/experiences)
0230 BBC (E As/Pa/Au)	Westway (drama serial)
0230 BBC (ME)	People and Places (forum for global views/experiences)
0230 BBC (E Af)	People and Places (forum for global views/experiences)
0245 BBC (E As/Pa/Au)	Music X-Press (trend-setting popular music)

Saturdays

0200 BBC (Am)	News
0200 BBC (E As/Pa/Au)	The World Today (int'l news/analysis)
0200 BBC (ME)	News
0200 BBC (E Af)	News
0200 BBC (S As)	The World Today (int'l news/analysis)
0205 BBC (Am)	Discovery (scientific ideas/trends/research)
0205 BBC (ME)	Discovery (scientific ideas/trends/research)
0205 BBC (E Af)	Discovery (scientific ideas/trends/research)
0230 BBC (Am)	Essential Guide (aspects of our world)
0230 BBC (E As/Pa/Au)	Global Business (about int'l business)
0230 BBC (ME)	Essential Guide (aspects of our world)
0230 BBC (E Af)	Essential Guide (aspects of our world)
0230 BBC (S As)	Global Business (about int'l business)

Hauser's Highlights

BELGIUM: RVI

B-00 English:
0400-0430 NAM 11985 (via Bonaire)
0800-0830 Eu 5985
1130-1200 EAs 9865 (via Russia)
1230-1300 Eu 9925
1830-1900 Eu 5910 9925 13710
2230-2300 NAM 13660 (Bonaire)
(Cees van Oudheusden, *Electronic DX Press*)



FREQUENCIES

0300 0400	Anguilla, Caribbean Beacon	6090am				0300 0400 vi/a	Solomon Islands, SIBC	9545do			
0300 0400 vl	Australia, ABC/Alice Springs	4835do				0300 0400	Taiwan, R Taiwan International	5950na	9680na	11745as	11825as
0300 0400 vl	Australia, ABC/Katherine	5025do						15345as			
0300 0400 vl	Australia, ABC/Tennant Creek	4910do				0300 0330	Thailand, Radio	9655am	11905am	15395na	
0300 0400	Australia, Christian Voice	9865va	15185va	17645va	1680va	0300 0400	Uganda, Radio	4976do	5026do		
0300 0400	Australia, Radio	9660pa	12080va	15240pa	5415as	0300 0400	UK, BBC World Service	3255af	5975na	6005af	6135am
		15515va	17580pa	17750as	1725pa			6175na	6190af	6195ue	7120af
0300 0330 sm w fa	Belarus, R Belarus International	6070pa						9410eu	11730af	11760me	12095af
0300 0400 vl	Botswana, Radio	3356do						15280as	15310as	15360as	17790as
0300 0400	Bulgaria, Radio	7400na						21660as			
0300 0400	Canada, CBC Northern Service	9625do				0300 0330 a	UK, Wales Radio Intl/Merlin	9735na			
0300 0400	Canada, CFRX Toronto ON	6070do				0300 0400	USA, Armed Forces Radio	4278va	4319va	4993va	5765va
0300 0400	Canada, CFVP Calgary AB	6030do						6350va	6458va	10320va	10940va
0300 0400	Canada, CKZN St John's NF	6160do						12579va	12689va	13362va	16847va
0300 0400	Canada, CKZU Vancouver BC	6160do				0300 0400	USA, KALJ Dallas TX	5755va			
0300 0356	China China Radio International	9690na				0300 0330	USA, KJES Vado NM	7555na			
0300 0400	Costa Rica, Faro del Caribe	5054ca	6175ca	9644ca		0300 0400	USA, KTBN Salt Lake City UT	7510na			
0300 0400	Costa Rica, R for Peace Intl	21815va				0300 0400	USA, KWHG Naalehu HI	17510as			
0300 0400	Costa Rica, R for Peace Intl	6970va				0300 0330	USA, Voice of America	4960af			
0300 0400 mtwhf	Costa Rica, University Network	5030am	6150va	7375na	9725na	0300 0400	USA, Voice of America	6080af	6115af	7105af	7275af
		11870va	13749af					7290af	7340af	9575af	17685af
0300 0400	Cuba, Radio Havana	6000na	9820na	11705na		0300 0400	USA, WBCQ Monticello ME	7415na	9335na		
0300 0400	Ecuador, HCJB	9745na	11840na	21455usb		0300 0400	USA, WEWN Birmingham AL	5825va	7425na		
0300 0330	Egypt, Radio Cairo	9475am				0300 0400	USA, WGTG McCaysville GA	5085va	6890am		
0300 0400 a/monthly	Finland, Scandv Weekend Radio	11720va				0300 0400	USA, WHRA Greenbush ME	7580na			
0300 0345	Germany, Deutsche Welle	6045na	9535na	9640na	9700na	0300 0400	USA, WHRI Noblesville IN	7315na			
		11750na				0300 0400	USA, WINB, Red Lion PA	12160am			
0300 0400 vl	Guatemala, Radio Cultural	3300do	5955do			0300 0400	USA, WJCR Upion KY	7490va	13595as		
0300 0400	Guyana, Voice of	3289do	5949do			0300 0400	USA, WRMI Miami FL	7385am			
0300 0400 sm	Honduras, Radio Luz y Vida	3250ca				0300 0400	USA, WSHB Cypress Crk SC	7535eu			
0300 0400	Japan, Radio	17825ca	21610pa			0300 0400	USA, WTJC Newport NC	9370na			
0300 0400	Kenya, Kenya BC Corp	4935do				0300 0400	USA, WWCR Nashville TN	3215am	5070am	5935am	7435am
0300 0400 vl	Lesotho, Radio	4800do				0300 0400	USA, WYFR Okeechobee FL	6065na	9505na		
0300 0400	Liberia, Voice of Hope	6280af				0300 0400 vl	Vanuatu, Radio	3945do	4960do	7260do	
0300 0400	Malaysia, Radio	7295do				0300 0310	Vatican City, Vatican Radio	7305am	9605am		
0300 0400	Malaysia, Voice of Islam	6175as	9750as	15295as		0300 0400	Zambia, Christian Voice	6065do			
0300 0400	Namibia, Namibian BC Corp	3270af	3289af			0300 0400 vl	Zambia, National BC Corp	6165do	6265do		
0300 0400	New Zealand, R New Zealand Int	17675pa				0300 0400 vl	Zimbabwe, Zimbabwe BC Corp	4828do	6045do		
0300 0400	Oman, Radio Sultanate of	15355va				0310 0340	Vatican City, Vatican Radio	9660af			
0300 0400 vl	Papua New Guinea, NBC	9675do	11880do			0330 0400	Albania, R Tirana International	6115na	7160na		
0300 0400	Russia, Voice of Russia WS	9665na	11990na	13690na	5595na	0330 0400	Hungary, Radio Budapest	9835na			
		17595na				0330 0345 vl	Libya, Voice of Africa	11815af	17725af		
0300 0330	S Africa, Adventist World Radio	6015af				0330 0400	Myanmar, Radio	9730do			
0300 0330	S Africa, Channel Africa	6035af				0330 0400	Sweden, Radio	9495na			
0300 0400	Singapore R Corp of Singapore	6150do				0330 0400	UAE, Radio Dubai	12005na	13675na	15395na	15400na
0300 0400 vl/as	Solomon Islands, SIBC	5020do				0330 0357	Vietnam, Voice of	9795na	9830na		
0300 0400	Sri Lanka, Sri Lanka BC Corp	6005as	6075as	6130do	9770as	0345 0400 f	Seychelles, FEBA Radio	11885af			
		15425as				0357 0400 vl	Malawi, Malawi BC Corp	5995do			

SELECTED PROGRAMS

Sundays

0300 BBC (All)	World Briefing
0320 BBC (All)	Sports Roundup
0330 BBC (Am/ME/S As)	Science in Action (topical research reports)
0330 BBC (E As/Pa/Au)	Science in Action (topical research reports)
0330 BBC (E Af)	Postmark Africa (expert answers to questions)
0330 BBC (W&S Af)	Postmark Africa (expert answers to questions)

Mondays

0300 BBC (Am/E Af/ME)	World Briefing
0300 BBC (E As/Pa/Au)	News
0300 BBC (S As)	News
0300 BBC (W&S Af)	World Briefing
0305 BBC (E As/Pa/Au)	One Planet (development & the environment)
0305 BBC (S As)	Talking Point (global current affairs)
0320 BBC (Am/E Af/ME)	Sports Roundup
0320 BBC (W&S Af)	Sports Roundup
0330 BBC (Am)	Assignment (a current topical issue)
0330 BBC (E As/Pa/Au)	People and Places (global views/experiences)
0330 BBC (E Af)	Network Africa (morning magazine)
0330 BBC (ME)	World Business Review (financial news)
0330 BBC (W&S Af)	Network Africa (morning magazine)
0345 BBC (ME)	Waveguide (int'l broadcasting report)
0345 BBC (ME)	Write On (letters/comments)[exc. one wk.]
0345 BBC (S As)	Off the Shelf (serialized book readings)

Tuesdays

0300 BBC (Am/E Af/ME)	World Briefing
0300 BBC (E As/Pa/Au)	News
0300 BBC (S As)	News
0300 BBC (W&S Af)	World Briefing
0305 BBC (E As/Pa/Au)	Discovery (scientific ideas/trends/research)
0305 BBC (S As)	Outlook (topical magazine)
0320 BBC (Am/E Af/ME)	Sports Roundup
0320 BBC (W&S Af)	Sports Roundup
0330 BBC (Am)	World Business Report
0330 BBC (E As/Pa/Au)	Essential Guide (aspects of our world)
0330 BBC (E Af)	Network Africa (morning magazine)
0330 BBC (ME)	World Business Report

Wednesdays

0330 BBC (W&S Af)	Network Africa (morning magazine)
0345 BBC (Am)	Analysis (of a current event/issue)
0345 BBC (ME)	Analysis (of a current event/issue)
0345 BBC (S As)	Off the Shelf (serialized book readings)

Wednesdays

0300 BBC (Am/E Af/ME)	World Briefing
0300 BBC (E As/Pa/Au)	News
0300 BBC (S As)	News
0300 BBC (W&S Af)	World Briefing
0305 BBC (E As/Pa/Au)	Health Matters (medical news/keeping fit)
0305 BBC (S As)	Outlook (topical magazine)
0320 BBC (Am/E Af/ME)	Sports Roundup
0320 BBC (W&S Af)	Sports Roundup
0330 BBC (Am)	World Business Report
0330 BBC (E As/Pa/Au)	Everywoman (international women's magazine)
0330 BBC (E Af)	Network Africa (morning magazine)
0330 BBC (ME)	World Business Report
0330 BBC (W&S Af)	Network Africa (morning magazine)
0345 BBC (Am/ME)	Analysis (of a current event/issue)
0345 BBC (S As)	Off the Shelf (serialized book readings)

Thursdays

0300 BBC (Am/E Af/ME)	World Briefing
0300 BBC (E As/Pa/Au)	News
0300 BBC (S As)	News
0300 BBC (W&S Af)	World Briefing
0305 BBC (E As/Pa/Au)	Science View (astronomy/discoveries/computing)
0305 BBC (S As)	Outlook (topical magazine)
0300 BBC (W&S Af)	World Briefing
0320 BBC (Am/E Af/ME)	Sports Roundup
0320 BBC (W&S Af)	Sports Roundup
0330 BBC (Am)	World Business Report
0330 BBC (E As/Pa/Au)	Focus on Faith (religious issues)
0330 BBC (E Af)	Network Africa (morning magazine)
0330 BBC (ME)	World Business Report
0330 BBC (W&S Af)	Network Africa (morning magazine)
0345 BBC (Am)	From Our Own Correspondent
0345 BBC (ME)	From Our Own Correspondent
0345 BBC (S As)	Off the Shelf (serialized book readings)

Fridays

0300 BBC (Am/E Af/ME)	World Briefing
0300 BBC (E As/Pa/Au)	News
0300 BBC (S As)	News
0300 BBC (W&S Af)	World Briefing
0305 BBC (E As/Pa/Au)	Focus on Football (global soccer)[1st wk.]
0305 BBC (E As/Pa/Au)	Sports International (anthologies)[exc. 1st wk.]
0305 BBC (S As)	Outlook (topical magazine)
0300 BBC (W&S Af)	World Briefing
0320 BBC (Am/E Af/ME)	Sports Roundup
0320 BBC (W&S Af)	Sports Roundup
0330 BBC (Am)	World Business Report
0330 BBC (E As/Pa/Au)	Pick of the World (World Service highlights)
0330 BBC (E Af)	Network Africa (morning magazine)
0330 BBC (ME)	World Business Report
0330 BBC (W&S Af)	Network Africa (morning magazine)
0345 BBC (Am)	Analysis (of a current event/issue)
0345 BBC (ME)	Analysis (of a current event/issue)
0345 BBC (S As)	Off the Shelf (serialized book readings)

Saturdays

0300 BBC (Am/E Af/ME)	World Briefing
0300 BBC (E As/Pa/Au)	News
0300 BBC (S As)	News
0300 BBC (W&S Af)	World Briefing
0305 BBC (E As/Pa/Au)	Wright Around the World (pop music/dedications)
0305 BBC (S As)	Outlook (topical magazine)
0300 BBC (W&S Af)	World Briefing
0320 BBC (Am/E Af/ME)	Sports Roundup
0320 BBC (W&S Af)	Sports Roundup
0330 BBC (Am)	World Business Report
0330 BBC (E Af)	African Quiz (current events test)[1st wk.]
0330 BBC (E Af)	This Week and Africa [exc. 1st wk.]
0330 BBC (ME)	World Business Report
0330 BBC (W&S Af)	African Quiz (current events test)[1st wk.]
0330 BBC (W&S Af)	This Week and Africa [exc. 1st wk.]
0345 BBC (Am)	Analysis (of a current event/issue)
0345 BBC (ME)	Analysis (of a current event/issue)
0345 BBC (S As)	Waveguide (int'l broadcasting report)[monthly]
0345 BBC (S As)	Write On (listener letters/comments)[exc. one wk.]

FREQUENCIES

0400	0500		Anguilla, Caribbean Beacon	6090am			0400	0430		Sri Lanka, Sri Lanka BC Corp	6005as	6075as	6130do	9770as
0400	0500	vl	Australia, ABC/Alice Springs	4835do							15425as			
0400	0500		Australia, ABC/Katherine	5025do			0400	0500		Switzerland, Swiss R International	9885am	9905am		
0400	0500	vl	Australia, ABC/Tennant Creek	4910do			0400	0500		Turkey, Voice of	6020na	7240as	9655as	21715as
0400	0500		Australia, Christian Voice	9865va	15185va	17645va	21680va	0400	0500	Uganda, Radio	4976do	5026do		
0400	0500		Australia, Radio	9660pa	12080va	15240pa	15415as	0400	0500	UK, BBC World Service	3225af	5975na	6005af	6005af
				15515va	17580pa	17750as	21725pa				6135am	6175na	6190af	6195se
0400	0430		Belgium, Radio Vlaanderen Intl	11985am							7160af	9410eu	11760me	12095eu
0400	0500	vl	Botswana, Radio	3356do	4820do	7255do					15310eu	15420af	15575me	17760as
0400	0500	vl	Cameroon, RTV/Yaounde	4850do							17790as	21660as	21830as	
0400	0500		Canada, CBC Northern Service	9625do				0400	0500	Ukraine, R Ukraine International	9610va	9810va		
0400	0500		Canada, CFRX Toronto ON	6070do				0400	0500	USA, Armed Forces Radio	4278va	4319va	4993va	5765va
0400	0500		Canada, CFVP Calgary AB	6030do							6350va	6458va	6847va	10320va
0400	0500		Canada, CKZN St John's NF	6160do							12689va	13362va	10940va	
0400	0500		Canada, CKZU Vancouver BC	6160do				0400	0500	USA, KAIJ Dallas TX	5755va			
0400	0429	as	Canada, R Canada International	11835me	11975me	15215me		0400	0500	USA, KBTN Salt Lake City UT	7510na			
0400	0456		China China Radio International	9730na				0400	0500	USA, KVOH Los Angeles CA	9975am			
0400	0500	mtwhf	Costa Rica, R for Peace Intl	6970va				0400	0500	USA, KWHR Naalehu HI	17780as			
0400	0500		Costa Rica, University Network	5030am	6150va	7375na	9725na	0400	0500	USA, Voice of America	6080af	7170va	7265af	7275af
				11870va	13749af						7290af	9575af	9885af	11965me
				6000na	9820na	11705na					15205va	17725af		
0400	0500		Cuba, Radio Havana	6000na				0400	0500	USA, WBCQ Monticello ME	7415na	9355na		
0400	0427		Czech Rep, Radio Prague Intl	7345na	7385na	9435na		0400	0500	USA, WEWN Birmingham AL	5825va	7425na		
0400	0500		Ecuador, HCJB	9745na	11840na	21455usb		0400	0500	USA, WGTG McCaysville GA	5085va	6890am		
0400	0445		Germany, Deutsche Welle	7280af	9565af	11935af	11965af	0400	0500	USA, WHRA Greenbush ME	7580na			
0400	0500	vl	Guatemala, Radio Cultural	3300do	5955do			0400	0500	USA, WHRI Noblesville IN	7315se			
0400	0500		Guyana, Voice of	3289do	5949do			0400	0500	USA, WINB Red Lion PA	12160am			
0400	0500	irreg	Iraq, Radio Iraq International	9684va	11787va			0400	0500	USA, WJCR Upton KY	7490va	13595as		
0400	0500		Kenya, Kenya BC Corp	4935do				0400	0500	USA, WMLK Bethel PA	7555va	9465alt		
0400	0500	vl	Lesotho, Radio	4800do				0400	0500	USA, WRMI Miami FL	7385am			
0400	0500		Liberia, Voice of Hope	6280af				0400	0500	USA, WSHB Cypress Crk SC	7535eu	12020af		
0400	0500	vl	Malawi, Malawi BC Corp	3380do	5995do			0400	0500	USA, WTJC Newport NC	9370na			
0400	0500		Malaysia, Radio	7295do				0400	0500	USA, WWCR Nashville TN	2390am	3215am	5070am	5935am
0400	0500		Malaysia, Voice of Islam	6175as	9750as	15295as		0400	0455	USA, WYFR Okeechobee FL	6065na	9505na	9985eu	
0400	0500	stwhfa	Mexico, R Mexico International	9705am				0400	0500	Zambia, Christian Voice	6065do			
0400	0500		Myanmar, Radio	9730do				0400	0500	vl	Zambia, National BC Corp	6165do	6265do	
0400	0500		Namibia, Namibian BC Corp	3270af	3289af			0400	0500	vl	Zimbabwe, Zimbabwe BC Corp	4828do	6045do	
0400	0500		New Zealand, R New Zealand Int	17675pa				0425	0400		Italy, RAI International	5975af	7150af	
0400	0500		New Zealand, ZLXA	3935do	7290do			0430	0500		Austria, R Austria International	6015na	6155se	13730eu
0400	0500	vl	Nigeria, Radio/Enugu	6025do				0430	0457		Czech Rep, Radio Prague Intl	9865va	11600va	
0400	0430	vl	Nigeria, Radio/Kaduna	6090do	7275do			0430	0500		Netherlands, Radio	6165na	9590na	
0400	0500		Papua New Guinea, NBC	9675do	11880do			0430	0500	vl	Nigeria, Radio/Ibadan	6050do		
0400	0456		Romania, R Romania International	9510na	11885na	11940na	15105na	0430	0500	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do
				15335as	17745as			0430	0500	vl	Nigeria, Radio/Lagos	3326do	4990do	9570do
0400	0500		Russia, Voice of Russia WS	7125na	9665na	11990na	15595na	0430	0500		Sri Lanka, Sri Lanka BC Corp	6130do		
				17595na	17650na	17660na	17690na	0430	0500		Swaziland, Trans World Radio	3200af	4775af	
0400	0430		S Africa, Channel Africa	5955af				0445	0500		USA, WYFR Okeechobee FL	9985eu		
0400	0500		Singapore R Corp of Singapore	6150do				0455	0500		Israel, Kol Israel	7410va	9435va	15640va
0400	0500	vl/as	Solomon Islands, SIBC	5020do									17545va	
0400	0500	vl/a	Solomon Islands, SIRC	9545do										

SELECTED PROGRAMS

Sundays

0400 BBC (All)	The World Today (international news/analysis)
0430 BBC (Am)	Global Business (about international business)
0430 BBC (E As/Pa/Au)	Omnibus (documentary)
0430 BBC (E Af)	African Perspective (opinion/comment/discussion)
0430 BBC (ME)	In Praise of God (services of worship)
0430 BBC (S As)	In Praise of God (services of worship)
0430 BBC (WGS Af)	African Perspective (opinion/comment/discussion)

Mondays

0400	BBC (Am/E Af/ME)	The World Today (international news/analysis)
0400	BBC (E As/Pa/Au)	The World Today (international news/analysis)
0400	BBC (S As)	News
0400	BBC (W&S Af)	The World Today (international news/analysis)
0405	BBC (S As)	Meridian-Ideas (cultural trends/thought)
0430	BBC (Am)	Westway Omnibus (two episodes of drama serial set in West London medical center)
0430	BBC (E Af)	Network Africa (morning magazine)
0430	BBC (S As)	Music Mix (showcasing popular music genres)
0430	BBC (W&S Af)	Network Africa (morning magazine)
0450	BBC (E As/Pa/Au)	Sports Roundup
0450	BBC (ME)	Sports Roundup

Tuesdays

0400 BBC (Am)	News
0400 BBC (E As/Pa/Au)	The World Today (international news/analysis)
0400 BBC (E Af)	The World Today (international news/analysis)
0400 BBC (ME)	The World Today (international news/analysis)
0400 BBC (S As)	News
0400 BBC (WBS Af)	The World Today (international news/analysis)
0405 BBC (Am)	Omnibus (documentaries)
0405 BBC (S As)	Meridian-Screen (international film/cinema)
0430 BBC (Am)	Body and Mind (health/medicine)
0430 BBC (E Af)	Network Africa (morning magazine)
0430 BBC (S As)	UK Top 20 (British top hits)
0430 BBC (WBS Af)	Network Africa (morning magazine)
0445 BBC (Am)	Off the Shelf (serialized book readings)

0450	BBC (E As/Pa/Au)	Sports Roundup
0450	BBC (ME)	Sports Roundup

Wednesdays

0400	BBC (Am)	News
0400	BBC (E As/Pa/Au)	The World Today (international news/analysis)
0400	BBC (E Af)	The World Today (international news/analysis)
0400	BBC (ME)	The World Today (international news/analysis)
0400	BBC (S As)	News
0400	BBC (W&S Af)	The World Today (international news/analysis)
0405	BBC (Am)	The Alternative ("leading edge" music w/John Peel or Steve Lamacq)
0405	BBC (S As)	Meridian-Music (classical music trends)
0430	BBC (Am)	Patterns of Faith (moral/spiritual reflections)
0430	BBC (E Af)	Network Africa (morning magazine)
0430	BBC (S As)	Westway (drama serial)
0430	BBC (W&S Af)	Network Africa (morning magazine)
0445	BBC (Am)	Off the Shelf (serialized book readings)
0445	BBC (S As)	UK Album Chart (top selling British CDs)
0450	BBC (E As/Pa/Au)	Sports Roundup
0450	BBC (ME)	Sports Roundup

Thursdays

0400	BBC (Am)	News
0400	BBC (E As/Pa/Au)	The World Today (international news/analysis)
0400	BBC (E Af)	The World Today (international news/analysis)
0400	BBC (ME)	The World Today (international news/analysis)
0400	BBC (S As)	News
0400	BBC (W&S Af)	The World Today (international news/analysis)
0405	BBC (Am)	Greenfield Collection (classical music requests)
0405	(S As)	Meridian-Writing (examining contemporary literature)
0430	BBC (Am)	Plain English (an language)
0430	BBC (E Af)	Network Africa (morning magazine)
0430	BBC (S As)	Westway (drama serial)
0430	BBC (S As)	World Music (showcasing global music trends)
0430	BBC (W&S Af)	Network Africa (morning magazine)
0445	BBC (Am)	Off the Shelf (serialized book readings)
0450	BBC (E As/Pa/Au)	Sports Roundup

0450 BBC (ME) Sports Roundup

Fridays

0400	BBC (Am)	News
0400	BBC (E As/Pa/Au)	The World Today (international news/analysis)
0400	BBC (E Af)	The World Today (international news/analysis)
0400	BBC (ME)	The World Today (international news/analysis)
0400	BBC (S As)	News
0400	BBC (W&S Af)	The World Today (international news/analysis)
0405	BBC (Am)	Jazzmatrazz (jazz magazine)
0405	BBC (S As)	Meridian-Masterpiece (best performances)
0430	BBC (Am)	Heart and Soul (questions on faith/religion)
0430	BBC (E Af)	Network Africa (morning magazine)
0430	BBC (W&S Af)	Network Africa (morning magazine)
0445	BBC (Am)	Off the Shelf (specialized book readings)
0445	BBC (S As)	Music X-Press (trend-setting popular music)
0450	BBC (E As/Pa/Au)	Sports Roundup
0450	BBC (ME)	Sports Roundup

Saturdays

0400	BBC (Am)	News
0400	BBC (E As/Pa/Au)	The World Today (international news/analysis)
0400	BBC (E Af)	The World Today (international news/analysis)
0400	BBC (ME)	The World Today (international news/analysis)
0400	BBC (S As)	The World Today (international news/analysis)
0400	BBC (W&S Af)	The World Today (international news/analysis)
0405	BBC (Am)	Panel game/Quiz show (rotating series)
0430	BBC (Am)	Wavelength (international broadcasting report)[monthly]
0430	BBC (Am)	Write On (listener letters/comments)[exc. one wk.]
0430	BBC (E As/Pa/Au)	Assignment (a current topical issue)
0430	BBC (E Af)	Talkabout Africa (discussion of African events/issues)
0430	BBC (S As)	Assignment (a current topical issue)
0430	BBC (W&S Af)	African Quiz (current events test)[1st wk.]
0430	BBC (W&S Af)	This Week and Africa (events review)[exc. 1st wk.]
0445	BBC (Am)	Off the Shelf (serialized book readings)



0500	0600		Anguilla, Caribbean Beacon	6090am				0500	0600		Russia, Voice of Russia WS	7125na	7180na	9665na	11990na	
0500	0600	vl	Australia, ABC/Alice Springs	4835do							15425na	15595na	17565na	17650na	17660na	
0500	0600	vl	Australia, ABC/Katherine	5025do							17690na					
0500	0600	vl	Australia, ABC/Tennant Creek	4910do				0500	0530		S Africa, Adventist World Radio	5960af	6015af			
0500	0530		Australia, Christian Voice	9865va	15185va	17645va	21680va	0500	0530		S Africa, Channell Africa	11720af				
0500	0600		Australia, Radio	9660pa	12080va	15240pa	15515va	0500	0600		Singapore R Corp of Singapore	6150do				
				17580pa	21725pa			0500	0600	vl	Solomon Islands, SIBC	5020do	9545do			
0500	0600	as	Australia, Radio	17750as				0500	0600		Spain, R Exterior Espana	6055na				
0500	0600	vl	Botswana, Radio	3356do	4820do	7255do		0500	0600		Sri Lanka, Sri Lanka BC Corp	6130do				
0500	0600	vl	Cameroon, RTV/Yaounde	4850do				0500	0600		Swaziland, Trans World Radio	4775af	6100af	9500af		
0500	0515		Canada, CBC Northern Service	9625do				0500	0530		Switzerland, Swiss R International	9655eu				
0500	0600		Canada, CFRX Toronto ON	6070do				0500	0530		Uganda, Radio	4976do	5026do			
0500	0600		Canada, CFVP Calgary AB	6030do				0500	0600		UK, BBC World Service	3255af	5975na	6005af	6175am	
0500	0600		Canada, CKZN St John's NF	6160do							6195eu	7160af	9410eu	9740as		
0500	0600		Canada, CKZU Vancouver BC	6160do							11760me	11765af	11955pa	12095eu	15280as	
0500	0529		Canada, R Canada International	5995am	6145va	7290va	9595va				15310as	15360as	15420af	15575me	17640me	
				9755am	11710va	11830am	13755va				17760as	17790as	17885af	21660as		
0500	0556		China China Radio International	9560na				0500	0600		USA, Armed Forces Radio	4278va	4319va	4993va	5765va	
0500	0600	mtwhf	Costa Rica, R for Peace Int'l	6970va							6350va	6458va	6847va	10320va	10940va	
0500	0600		Costa Rica, University Network	5030am	6150va	7375na	9725na				12579va	12689va	13362va	16847va		
				11870va	13749af			0500	0600		USA, KAIJ Dallas TX	5755va				
0500	0600		Cuba, Radio Havana	9550na	9820na	9830na		0500	0600		USA, KLTN Salt Lake City UT	7510na				
0500	0600		Ecuador, HCJB	9745na	11840na	21455usb		0500	0600		USA, KVOH Los Angeles CA	9975am				
0500	0600	a/monthly	Finland, Scandv Weekend Radio	11720va				0500	0600		USA, KWHR Naalehu HI	11565pa	17780as			
0500	0545		Germany, Deutsche Welle	5960na	6120na	9670na	11795na	0500	0600		USA, Voice of America	5970af	6035af	6080af	7170va	
0500	0600		Guyana, Voice of	3289do	5949do						7195af	11965me	12080af	13670af	15205va	
0500	0515		Israel, Kol Israel	7410va	9435va	15640va	17545va	0500	0600		USA, WBCQ Monticello ME	7415na	9330na			
0500	0600		Japan, Radio	5975eu	6110na	7230eu	11715as	0500	0600		USA, WEWN Birmingham AL	5825va	7425na			
				11760as	11840us	13630na	15590pa	0500	0600		USA, WGTG McCaysville GA	5085va	6890am			
0500	0600		Kenya, Kenya BC Corp	4935do				0500	0600		USA, WHRA Greenbush ME	7435af				
0500	0600		Kuwait, Radio	15110va				0500	0600		USA, WHRI Noblesville IN	7315sa				
0500	0600	vl	Lesotho, Radio	4800do				0500	0600		USA, WJCR Upton KY	7490va	13595as			
0500	0600	vl	Liberia, R Liberia International	5100do				0500	0600		USA, WMLK Bethel PA	7555va	9465alt			
0500	0600		Liberia, Voice of Hope	6280af				0500	0600		USA, WRMI Miami FL	7385am				
0500	0600	vl	Malawi, Malawi BC Corp	3380do	5995do			0500	0600		USA, WSHB Cypress Crk SC	7535eu	15195af			
0500	0600		Malaysia, Radio	7295do				0500	0600		USA, WTJC Newport NC	9370na				
0500	0600		Malaysia, RTM Sarawak	7160do				0500	0505	sm	USA, WWCR Nashville TN	3210am				
0500	0600		Malaysia, Voice of Islam	6175as	9750as	15295as		0500	0505	twhta	USA, WWCR Nashville TN	3215am				
0500	0530	twhta	Mexico, R Mexico International	9705am				0500	0600		USA, WWCR Nashville TN	2390am	3210am	5070am	5935am	
0500	0600		Myanmar, Radio	9730do				0500	0600		USA, WYFR Okeechobee FL	5985na	9985eu	11580eu		
0500	0600		Namibia, Namibian BC Corp	3270af	3289af			0500	0600	vl	Vanuatu, Radio	3945do	4960do	7260do		
0500	0530		Netherlands, Radio	6165na	9590na			0500	0520		Vatican City, Vatican Radio	9660af	11625af	15570af		
0500	0600		New Zealand, R New Zealand Int	17675pa				0500	0600		Zambia, Christian Voice	6065do				
0500	0600		New Zealand, ZLXA	3935do	7290do			0500	0600	vl	Zambia, National BC Corp	6165do	6265do			
0500	0600	vl	Nigeria, Radio/Enugu	6025do				0500	0530	vl	Zimbabwe, Zimbabwe BC Corp	4828do	6045do			
0500	0600	vl	Nigeria, Radio/Ibadan	6050do				0515	0525		Rwanda, Radio	6055do				
0500	0600	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do	0520	0530		Vatican City, Vatican Radio	9660af	11625af	15570af		
0500	0600	vl	Nigeria, Radio/Lagos	3326do	4990do			0525	0600	vl	Ghana, Ghana BC Corp	3366do	4915do			
0500	0600	vl	Nigeria, Voice of	7255af	15120af			0530	0600	vl	Italy, IRRS	3985va				
0500	0504		Pakistan, Radio	15175me	17835me	21460me		0530	0600		Thailand, Radio	9655eu	11905eu	21795eu		
0500	0600	vl	Papua New Guinea, NBC	9675do	11880do			0530	0600		UAE, Radio Dubai	13675eu	15435eu	21700au		
								0530	0600	vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do			

SELECTED PROGRAMS

0500	BBC (Am)	News
0500	BBC (Eu/N Af)	The World Today (international news/analysis)
0500	BBC (E As/Pa/Au)	The World Today (international news/analysis)
0500	BBC (E Af)	The World Today (international news/analysis)
0500	BBC (ME)	The World Today (international news/analysis)
0500	BBC (S As)	The World Today (international news/analysis)
0500	BBC (W&S Af)	The World Today (international news/analysis)
0505	BBC (Am)	Wright Around the World (pop music/dedications)
0530	BBC (Eu/N Af)	Reporting Religion
0530	BBC (E As/Pa/Au)	Reporting Religion
0530	BBC (E Af)	Art Beat (the arts in Africa)
0530	BBC (ME)	Global Business (about international business)
0530	BBC (S As)	Reporting Religion
0530	BBC (W&S Af)	Art Beat (the arts in Africa)
0545	BBC (E As/Pa/Au)	Letter from America (weekly commentary)
0545	BBC (S As)	Letter from America (weekly commentary)

0500	BBC (Am)	The World Today (international news/analysis)
0500	BBC (Eu/N Af)	The World Today (international news/analysis)
0500	BBC (E As/Pa/Au)	The World Today (international news/analysis)
0500	BBC (E Af)	The World Today (international news/analysis)
0500	BBC (Ct)	The World Today (international news/analysis)
0500	BBC (S As)	News
0500	BBC (W&S Af)	The World Today (international news/analysis)
0505	BBC (S As)	One Planet (development and the environment)
0530	BBC (E As/Pa/Au)	Body and Mind (health/medicine)
0530	BBC (E Af)	Network Africa (morning magazine)
0530	BBC (S As)	People and Places (forum for global views)
0530	BBC (W&S Af)	Network Africa (morning magazine)
0545	BBC (E As/Pa/Au)	Off the Shelf (serialized book readings)

0500 BBC (Am) The World Today (international news/analysis)

0500	BBC (E As/Rf/Au)	The World Today (international news/analysis)
0500	BBC (E As)	The World Today (international news/analysis)
0500	BBC (ME)	The World Today (international news/analysis)
0500	BBC (S As)	News
0500	BBC (W&S Af)	The World Today (international news/analysis)
0505	BBC (S As)	Discovery (scientific ideas/trends/research)
0530	BBC (E As/Pa/Au)	Patterns of Faith (moral/spiritual reflections)
0530	BBC (E Af)	Network Africa (morning magazine)
0530	BBC (S As)	Essential Guide (backgrounding aspects of our world)
0530	BBC (W&S Af)	Network Africa (morning magazine)
0545	BBC (E As/Pa/Au)	Off the Shelf (serialized book readings)

0500	BBC (Am/E Af/ME)	The World Today (international news/analysis)
0500	BBC (Eu/N Af)	The World Today (international news/analysis)
0500	BBC (E As/Pa/Au)	The World Today (international news/analysis)
0500	BBC (S As)	News
0500	BBC (W&S Af)	The World Today (international news/analysis)
0505	BBC (S As)	Health Matters (medical news/keeping fit)
0530	BBC (E As/Pa/Au)	Plain English (on language)
0530	BBC (E Af)	Network Africa (morning magazine)
0530	BBC (S As)	Everywoman (international women's magazine)
0530	BBC (W&S Af)	Network Africa (morning magazine)
0545	BBC (E As/Pa/Au)	Off the Shelf (serialized book readings)

0500	BBC (Am)	The World Today (international news/analysis)
0500	BBC (Eu/N Af)	The World Today (international news/analysis)
0500	BBC (C As/Pa/Au)	The World Today (international news/analysis)
0500	BBC (E Af)	The World Today (international news/analysis)
0500	BBC (ME)	The World Today (international news/analysis)
0500	BBC (S As)	News
0500	BBC (W&S Af)	The World Today (international news/analysis)
0505	BBC (S As)	Science View (astronomy/discoveries/computing)
0530	BBC (C As/Pa/Au)	Heart and Soul (questions on faith/religion)

0530	BBC (S AS)	Focus on Faith (religious issues)
0530	BBC (W&S Af)	Network Africa (morning magazine)
0545	BBC (E As/Pa/Au)	Off the Shelf (serialized book readings)

0500	BBC (Am/E Af/ME)	The World Today (international news/analysis)
0500	BBC (Eu/N Af)	The World Today (international news/analysis)
0500	BBC (E As/Pa/Au)	The World Today (international news/analysis)
0500	BBC (S As)	News
0500	BBC (W&S Af)	The World Today (international news/analysis)
0505	BBC (S As)	Focus on Football (global soccer)[1st wk.]
0505	BBC (S As)	Sports International (anthologies)[exc. 1st wk.]
0530	BBC (E As/Pa/Au)	Best of The Edge (youth magazine)
0530	BBC (E Af)	Network Africa (morning magazine)
0530	BBC (S As)	Pick of the World (World Service)
0530	BBC (W&S Af)	Network Africa (morning magazine)
0545	BBC (E As/Pa/Au)	Off the Shelf (serialized book readings)

0500	BBC (Am)	The World Today (international news/analysis)
0500	BBC (Eu/N Af)	The World Today (international news/analysis)
0500	BBC (E As/Pa/Au)	The World Today (international news/analysis)
0500	BBC (E Af)	The World Today (international news/analysis)
0500	BBC (ME)	The World Today (international news/analysis)
0500	BBC (S As)	News
0500	BBC (W&S Af)	The World Today (international news/analysis)
0505	BBC (S As)	Wright Around the World (pop music/dedications)
0530	BBC (Eu/N Af)	Weekend (magazine)
0530	BBC (E As/Pa/Au)	Arts in Action (global arts magazine)
0530	BBC (E Af)	African Quiz (current events test)[1st wk.]
0530	BBC (E Af)	This Week and Africa (regional events review)[exc. 1st wk.]
0530	BBC (ME)	Arts in Action (global arts magazine)
0530	BBC (W&S Af)	Talkabout Africa (discussion of African events/issues)



FREQUENCIES

0600	0700		Anguilla, Caribbean Beacon	6090am				0600	0700		Sri Lanka, Sri Lanka BC Corp	6130do			
0600	0700	vi	Australia, ABC/Alice Springs	4835do				0600	0700		Swaziland, Trans World Radio	4775af	6100af	9500af	
0600	0700		Australia, ABC/Katherine	5025do				0600	0630		Switzerland, Swiss R International	9655seu			
0600	0700	vi	Australia, ABC/Tennant Creek	4910do				0600	0700		Uganda, Radio	5026do	7110do	7196do	
0600	0700		Australia, Radio	9660as	12080va	15240pa	15415as	0600	0700		UK, BBC World Service	6055af	6175am	6190af	6195seu
				15515va	17580pa	17750as	21725pa				7160af	9410eu	9580va	9740as	11760me
0600	0700	vi	Botswana, Radio	7255do							11765af	11940af	11940af	11955pa	12095seu
0600	0700	vi	Cameroon, RTV/Yaounde	4850do							15310as	15360as	15420af	15485eu	15565as
0600	0700		Canada, CFRX Toronto ON	6070do							15575af	17640af	17760as	17790as	17885af
0600	0700		Canada, CFVP Calgary AB	6030do							21660as				
0600	0700		Canada, CKZN St John's NF	6160do				0600	0700		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
0600	0700		Canada, CKZU Vancouver BC	6160do							6350va	6458va	6847va	10320va	10940va
0600	0700	mtwhf	Costa Rica, R for Peace Intl	6970va							12579va	12689va	13362va	16847va	
0600	0700		Costa Rica, University Network	5030am	6150va	7375na	9725na	0600	0700		USA, KAJJ Dallas TX	5755va			
				11870va	13749af			0600	0700		USA, KTVN Salt Lake City UT	7510na			
0600	0700		Cuba, Radio Havana	9550na	9820na	9830na		0600	0700		USA, KVOH Los Angeles CA	9975am			
0600	0700		Ecuador, HCJB	9745na	11840na	21455usb		0600	0700		USA, KWHR Naelehu HI	11565pa	17780as		
0600	0700	a/monthly	Finland, Scandv Weekend Radio	11720na				0600	0630		USA, Voice of America	5970af	6035af	6080af	7170va
0600	0645		Germany, Deutsche Welle	7225af	9565af	11785af					7195af	9680af	11805af	11965me	11995af
0600	0700		Germany, Deutsche Welle	6140eu							12080af	13670af	15205va		
0600	0700		Germany, Voice of Hope	21590me				0600	0700		USA, WBCQ Monticello ME	7415na			
0600	0700	vi	Ghana, Ghana BC Corp	3366do	4915do			0600	0700		USA, WEWN Birmingham AL	5825va	7425na		
0600	0700		Guyana, Voice of	3289do	5949do			0600	0700		USA, WGTG McCaysville GA	5085va	6890am		
0600	0700	vi	Italy, IRRS	3985va				0600	0700		USA, WHRA Greenbush ME	7435af			
0600	0700		Japan, Radio	5975seu	7230eu	11740as	11840as	0600	0700		USA, WHRI Noblesville IN	7315sa			
				13630na	15230pa	21570pa		0600	0700		USA, WJCR Upton KY	7490va	13595as		
0600	0700		Kenya, Kenya BC Corp	4935do				0600	0700		USA, WMLK Bethel PA	7555va	9465alt		
0600	0700		Kuwait, Radio	15110va				0600	0700		USA, WRMI Miami FL	7385am			
0600	0700	vi	Lesotho, Radio	4800do				0600	0700		USA, WSHB Cypress Crk SC	7535af			
0600	0700	vi	Liberia, ELWA	4760do				0600	0700		USA, WTJC Newport NC	9370na			
0600	0700	vi	Liberia, R Liberia International	5100do				0600	0700		USA, WWCR Nashville TN	2390am	3210am	5070am	5935am
0600	0700		Liberia, Voice of Hope	6280af				0600	0700		USA, WYFR Okeechobee FL	5985na	7355seu		
0600	0700	vi	Malawi, Malawi BC Corp	3380do	5995do			0600	0700	vi	Vanuatu, Radio	3945do	4960do	7260do	
0600	0700		Malaysia, Radio	7295do				0600	0620		Vatican City, Vatican Radio	4005eu	5880eu	7250eu	
0600	0700		Malaysia, RTM Sarawak	7160do				0600	0700		Yemen, Rep of Yemen Radio	9779me			
0600	0700		Malaysia, Voice of	6175as	9750as	15295as		0600	0700		Zambia, Christian Voice	9865do			
0600	0700		Myanmar, Radio	9730do				0600	0700	vi	Zambia, National BC Corp	6165do	6265do		
0600	0700		Namibia, Namibian BC Corp	3270af	3289af			0600	0700	vi	Zimbabwe, Zimbabwe BC Corp	5975do	6045do		
0600	0700		New Zealand, ZLXZ	3935do	7290do			0610	0620	mtwhf	Greece, Voice of	7475va	9375va	9420va	15630va
0600	0700	vi	Nigeria, Radio/Enugu	6025do				0615	0630	a	S. Africa, Trans World Radio	11640af			
0600	0700	vi	Nigeria, Radio/Ibadan	6050do				0630	0645		Finland, YLE/R Finland	15250va	21670va		
0600	0700	vi	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do	0630	0700		Georgia, Georgian Radio	11805eu			
0600	0700	vi	Nigeria, Radio/Lagos	3326do	4990do			0630	0700	mtwhfa	UK, BBC World Service	6175am			
0600	0700	vi	Nigeria, Voice of	7255af	15120af			0630	0700		USA, Voice of America	7170va	9680af	11805af	11965me
0600	0700	vi	Papua New Guinea, NBC	9675do	11880do						15205va				
0600	0641		Romania, R Romania International	11940na	15335na			0630	0700	as	USA, Voice of America	5970af	6035af	6080af	7195af
0600	0700		Russia, Voice of Russia WS	17625su	17665su	21790au					11995af	12080af	13670af		
0600	0630		S Africa, Channell Africa	15215af				0630	0645		Vatican City, Vatican Radio	11625af	13765af	15570af	
0600	0615		S Africa, Trans World Radio	11640af				0641	0656		Romania, R Romania International	9570eu	9665eu	11885na	11940na
0600	0700		Sierra Leone, Sierra Leone BS	3316do							15250eu	15335na			
0600	0700		Singapore R Corp of Singapore	6150do				0645	0655	as	Germany, Trans World Radio	6045eu			
0600	0700	vi	Solomon Islands, SIBC	5020do	9545do			0655	0700		Germany, Trans World Radio	6045eu			

SELECTED PROGRAMS

Sundays

0600	BBC (All)	The World Today (international news/analysis)
0600	BBC (W&S Af)	World Briefing
0630	BBC (Am)	Agenda (contemporary ideas/trends)
0630	BBC (E As/Pa/Au)	Westway Omnibus (last week's 2 episodes)
0630	BBC (E Af/ME)	Agenda (contemporary ideas/trends)
0630	BBC (Eu/N Af)	Agenda (contemporary ideas/trends)
0630	BBC (S As)	Westway Omnibus (last week's 2 episodes)
0630	BBC (W&S Af)	Agenda (contemporary ideas/trends)

Mondays

0600	BBC (AM/ME/S As)	The World Today (international news/analysis)
0600	BBC (E As/Pa/Au)	News
0600	BBC (E Af)	News
0600	BBC (W&S Af)	World Briefing
0600	BBC (Eu/N Af)	The World Today (international news/analysis)
0605	BBC (E As/Pa/Au)	Meridian-Masterpiece (showcasing best performances)
0605	BBC (E Af)	Talking Point (global current affairs phone-in)
0620	BBC (W&S Af)	Sports Roundup (British/world scores/reports)
0630	BBC (Am)	Play of the Week (contemporary radio drama)
0630	BBC (E As/Pa/Au)	Panel game/Quiz show (rotating series)
0630	BBC (S As)	World Learning (various educational series)
0630	BBC (W&S Af)	Network Africa (morning magazine)
0645	BBC (E Af)	Off the Shelf (serialized book readings)

Tuesdays

0600	BBC (Am/E Af)	News
0600	BBC (E As/Pa/Au)	News
0600	BBC (M/S As)	The World Today (international news/analysis)
0600	BBC (W&S Af)	World Briefing
0600	BBC (Eu/N Af)	The World Today (international news/analysis)
0605	BBC (Am)	Meridian-Masterpiece (showcasing best performances)
0605	BBC (E As/Pa/Au)	Meridian-Ideas (cultural trends/thought)

0605	BBC (E Af)	Outlook (topical magazine)
0620	BBC (W&S Af)	Sports Roundup (British/world scores/reports)
0630	BBC (Am)	Panel game/Quiz show (rotating series)
0630	BBC (E As/Pa/Au)	Music Mix (showcasing popular music genres)
0630	BBC (S As)	World Learning (various educational series)
0630	BBC (W&S Af)	Network Africa (morning magazine)
0645	BBC (E Af)	Off the Shelf (serialized book readings)

Wednesdays

0600	BBC (Am/E Af)	News
0600	BBC (E As/Pa/Au)	News
0600	BBC (ME/S As)	The World Today (international news/analysis)
0600	BBC (W&S Af)	World Briefing
0600	BBC (Eu/N Af)	The World Today (international news/analysis)
0605	BBC (Am)	Meridian-Ideas (cultural trends/thought)
0605	BBC (E As/Pa/Au)	Meridian-Screen (international film/anema)
0605	BBC (E Af)	Outlook (topical magazine)
0620	BBC (W&S Af)	Sports Roundup (British/world scores/reports)
0630	BBC (Am)	Music Mix (showcasing popular music genres)
0630	BBC (E As/Pa/Au)	UK Top 20 (British top hits)
0630	BBC (S As)	World Learning (various educational series)
0630	BBC (W&S Af)	Network Africa (morning magazine)
0645	BBC (E Af)	Off the Shelf (serialized book readings)

Thursdays

0600	BBC (Am/E Af)	News
0600	BBC (E As/Pa/Au)	News
0600	BBC (ME/S As)	The World Today (international news/analysis)
0600	BBC (W&S Af)	World Briefing
0600	BBC (Eu/N Af)	The World Today (international news/analysis)
0605	BBC (Am)	Meridian-Screen (international film/cinema)
0605	BBC (E As/Pa/Au)	Meridian-Music (classical music trends)
0605	BBC (Af)	Outlook (topical magazine)
0620	BBC (W&S Af)	Sports Roundup (British/world scores/reports)
0630	BBC (Am)	UK Top 20 (British top hits)
0630	BBC (E As/Pa/Au)	Omnibus (documentary)

0630	BBC (S As)	World Learning (various educational series)
0630	BBC (W&S Af)	Network Africa (morning magazine)
0645	BBC (E Af)	Off the Shelf (serialized book readings)

Fridays

0600	BBC (Am/E Af)	News
0600	BBC (E As/Pa/Au)	News
0600	BBC (ME/S As)	The World Today (international news/analysis)
0600	BBC (W&S Af)	World Briefing
0600	BBC (Eu/N Af)	The World Today (international news/analysis)
0605	BBC (Am)	Meridian-Music (classical music trends)
0605	BBC (E As/Pa/Au)	Meridian-Writing (contemporary literature)
0605	BBC (E Af)	Outlook (topical magazine)
0620	BBC (W&S Af)	Sports Roundup (British/world scores/reports)
0630	BBC (Am)	Omnibus (documentaries)
0630	BBC (E As/Pa/Au)	World Music (showcasing global music trends)
0630	BBC (S As)	World Learning (various educational series)
0630	BBC (W&S Af)	Network Africa (morning magazine)
0645	BBC (E Af)	Off the Shelf (serialized book readings)

Saturdays

0600	BBC (Am/E Af)	News
0600	BBC (E As/Pa/Au)	The World Today (international news/analysis)
0600	BBC (ME/S As)	The World Today (international news/analysis)
0600	BBC (W&S Af)	World Briefing
0600	BBC (Eu/N Af)	The World Today (international news/analysis)
0605	BBC (Am)	Meridian-Writing (examining contemporary literature)
0605	BBC (E Af)	Outlook (topical magazine)
0630	BBC (Am)	World Music (showcasing global music trends)
0630	BBC (E As/Pa/Au)	People and Politics (the week in Parliament)
0630	BBC (ME/Eu/N Af/S As)	People and Politics (the week in Parliament)
0630	BBC (W&S Af)	African Quiz (current events test) [1st wk.]
0630	BBC (W&S Af)	This Week and Africa (regional events review) [exc. 1st wk.]



FREQUENCIES

0700	0800		Anguilla, Caribbean Beacon	6090am			
0700	0800	vl	Australia, ABC/Alice Springs	4835do			
0700	0800	vl	Australia, ABC/Katherine	5025do			
0700	0800	vl	Australia, ABC/Tennant Creek	4910do			
0700	0800		Australia, Radio	9660pa	12080va	15240pa	15415as
				17580pa	17750as	21725pa	
0700	0800	vl	Botswana, Radio	7255do			
0700	0800	vl	Cameroon, RTV/Yaounde	4850do			
0700	0800		Canada, CFRX Toronto ON	6070do			
0700	0800		Canada, CFVP Calgary AB	6030do			
0700	0800		Canada, CKZN St John's NF	6160do			
0700	0800		Canada, CKZU Vancouver BC	6160do			
0700	0800	mtwhf	Costa Rica, R for Peace Intl	6970va			
0700	0800		Costa Rica, University Network	5030am	6150va	7375na	9725na
				11870va	13749af		
0700	0800		Ecuador, HCJB	9780eu		21455usb	
0700	0800	mtwhf	Eq. Guinea, Radio Africa	15185af			
0700	0800	as/vl	Eq. Guinea, Radio Est Africa	15185af			
0700	0800	a/monthly	Finland, Scandv Weekend Radio	11720va			
0700	0800		Germany, Deutsche Welle	6140eu			
0700	0800		Germany, Trans World Radio	6045eu			
0700	0800		Germany, Voice of Hope	5975eu	21590me		
0700	0800	vl	Ghana, Ghana BC Corp	3366do	4915do		
0700	0800	vl	Ghana, Ghana BC Corp	3366do	4915do		
0700	0800		Guyana, Voice of	3289do	5949do		
0700	0800	vl/mtwhf	Italy, IRRS	7120va			
0700	0800		Kenya, Kenya BC Corp	4935do			
0700	0800		Kuwait, Radio	15110va			
0700	0800	vl	Lesotho, Radio	4800do			
0700	0800	vl	Liberia, ELWA	4760do			
0700	0800	vl	Liberia, R Liberia International	5100do			
0700	0800		Liberia, Voice of Hope	6280af			
0700	0800	vl	Malawi, Malawi BC Corp	3380do	5995do		
0700	0800		Malaysia, Radio	7295do			
0700	0800		Malaysia, RTM Sarawak	7160do			
0700	0800		Malaysia, Voice of	6275as	9750as	15295as	
0700	0730	mtwhfa	Malta, Voice of Mediterranean	6010eu			
0700	0800		Myanmar, Radio	9730do			
0700	0800		Namibia, Namibian BC Corp	3270af	3289af		
0700	0705		New Zealand, R New Zealand Int	17675pa			
0700	0800		New Zealand, ZLXA	3935do	7290do		
0700	0800	vl	Nigeria, Radio/Enugu	6025do			
0700	0800	vl	Nigeria, Radio/Ibadan	6050do			
0700	0800	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
0700	0800	vl	Nigeria, Radio/Lagos	3326do	4990do		
0700	0800		Palau, KHBN/Voice of Hope	9965as	9985as	15725as	
0700	0730	vl	Papua New Guinea, NBC	9675do	11880do		
0700	0756		Romania, R Romania International	15250af	17735af		
0700	0800		Russia, Voice of Russia WS	15490au	17625au	17655au	17665au
				21790au			
0700	0800		Sierra Leone, Sierra Leone BS	3316do			
0700	0800		Singapore R Corp of Singapore	6150do			
0700	0730	vl	Slovakia, R Slovakia International	15460au	17550au	21705au	
0700	0800		Solomon Islands, SIBC	5020do	9545do		
0700	0800		Sri Lanka, Sri Lanka BC Corp	6130do			
0700	0720		Swaziland, Trans World Radio	4775af	6100af	9500af	
0700	0800		Taiwan, R Taiwan International	5950na			
0700	0800		Uganda, Radio	5026do	7110do	7196do	
0700	0730	as	UK, BBC World Service	17885af			
0700	0730	mtwhfa	UK, BBC World Service	6190af			
0700	0800		UK, BBC World Service	6190af	9580va	9740as	11760me
				11765af	11940af	11955pa	12095eu
				15310as	15360as	15400af	15485eu
				15565eu	17640eu	17760as	17790as
				17830af	21660as		
0700	0800		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
				6350va	6458va	6847va	10320va
				10940va	12579va	12689va	13362va
				16847va			
0700	0800		USA, KAU Dallas TX	5755va			
0700	0800		USA, KBTN Salt Lake City UT	7510na			
0700	0800		USA, KWHR Naelehu HI	11565pa	17780as		
0700	0730	a	USA, Voice of America	6873va			
0700	0800		USA, WEWN Birmingham AL	5825va	7425na		
0700	0800		USA, WHRA Greenbush ME	7435af			
0700	0800		USA, WHRI Noblesville IN	7315sa			
0700	0800		USA, WJCR Upton KY	7490va	13595as		
0700	0800		USA, WMLK Bethel PA	7555va	9465alt		
0700	0800		USA, WRMI Miami FL	7385am			
0700	0800		USA, WSHB Cypress Crk SC	7535af			
0700	0800		USA, WTJC Newport NC	9370na			
0700	0800		USA, WWCN Nashville TN	23900am	3210am	5070am	5935am
0700	0745		USA, WYFR Okeechobee FL	7355eu	13695va	15170eu	
0700	0800	vl	Vanuatu, Radio	3945do	4960do	7260do	
0700	0800		Zambia, Christian Voice	9865do			
0700	0800	vl	Zambia, National BC Corp	6165do	6265do		
0700	0800	vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do		
0705	0800		New Zealand, R New Zealand Int	15175pa			
0730	0800		Austria, R Austria International	15410me	17870me		
0730	0800	th	Georgia, Georgian Radio	6080eu			
0730	0740	as	Guam, Trans World Radio	15200as			
0730	0800	vl	Papua New Guinea, NBC	4890do	9675do		
0730	0800		Switzerland, Swiss R International	9885af	13635af	17665af	
0730	0800	as	UK, BBC World Service	15575as	17885af		
0730	0745	mtwhf	Vatican City, Vatican Radio	4005eu	5880eu	7250eu	9645eu
				11740eu	15595eu		
0740	0800		Guam, Trans World Radio	15200as			
0745	0755	as	Monaco, Trans World Radio	9870eu			
0750	0800	as	Greece, Voice of	9775eu			
0755	0800		Monaco, Trans World Radio	9870eu			

0800	0900		Anguilla, Caribbean Beacon	6090am			
0800	0830	vl	Australia, ABC/Alice Springs	4835do			
0800	0830	vl	Australia, ABC/Katherine	5025do			
0800	0830	vl	Australia, ABC/Tennant Creek	4910do			
0800	0900		Australia, Radio	5995pa 15240va	9710pa 15415as	12080va 17750as	13605pa 21725pa
0800	0830		Belgium, Radio Vlaanderen Intl	5985eu			
0800	0900	vl	Botswana, Radio	7255do	9600do	7255do	
0800	0900	vl	Cameroon, RTV/Yaounde	4850do			
0800	0900		Canada, CFRX Toronto ON	6070do			
0800	0900		Canada, CFVP Calgary AB	6030do			
0800	0900		Canada, CKZN St John's NF	6160do			
0800	0900		Canada, CKZU Vancouver BC	6160do			
0800	0900		Costa Rica, University Network	5030am 11870va	6150va 13749af	7375na 15255eu	9725na
0800	0827		Czech Rep, Radio Prague Intl	11600eu			
0800	0900		Ecuador, HCJB	9780eu	11755pa	21455usb	
0800	0900	mtwhf	Eqt Guinea, Radio Africa	15185af			
0800	0900	as/vl	Eqt. Guinea, Radio East Africa	15185af			
0800	0900	a/monthly	Finland, Scandv Weekend Radio	11720va			
0800	0900		Germany, Deutsche Welle	6140eu			
0800	0820		Germany, Trans World Radio	6045eu			
0800	0900		Germany, Voice of Hope	5975eu	21590me		
0800	0900	vl	Ghana, Ghana BC Corp	3366do	4915do		
0800	0900	as	Guam, Trans World Radio	15200as	15330as		
0800	0900		Guyana, Voice of	3289do	5949do		
0800	0900		Indonesia, Voice of	9525va	11785va	15149va	
0800	0900	vl/as	Italy, IRRS	7120va			
0800	0900		Kenya, Kenya BC Corp	4935do			
0800	0900	vl	Lesotho, Radio	4800do			
0800	0900	vl	Liberia, ELWA	4760do			
0800	0900	vl	Liberia, R Liberia International	5100do			
0800	0900		Liberia, Voice of Hope	6280af			
0800	0810	vl	Malawi, Malawi BC Corp	3380do	5995do		
0800	0900		Malaysia, Radio	7295do			
0800	0825		Malaysia, Voice of	6275as	9750as	15295as	
0800	0900		Monaco, Trans World Radio	9870eu			
0800	0830		Myanmar, Radio	9730eu			
0800	0900		Namibia, Namibian BC Corp	7165af	7215af		
0800	0900		New Zealand, R New Zealand Int	15175pa			
0800	0900		New Zealand, ZLXA	3935do	7290do		
0800	0900	vl	Nigeria, Radio/Enugu	6025do			
0800	0900	vl	Nigeria, Radio/Ibadan	6050do			
0800	0900	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
0800	0900	vl	Nigeria, Radio/Lagos	3326do	4990do		
0800	0804		Pakistan, Radio	17525eu	21460eu		
0800	0900		Palau, KHBN/Voice of Hope	9955as	9965as	9985as	15725as
0800	0900	vl	Papua New Guinea, NBC	4890do	9675do		
0800	0900		Russia, Voice of Russia WS	15490au 21790au	17495au	17625au	17655au
0800	0900	s	S Africa, Amateur Radio League	9750af	21560af		
0800	0900		Sierra Leone, Sierra Leone BS	3316do			
0800	0900	vl	Singapore R Corp of Singapore	6150do			
0800	0900		Solomon Islands, SIBC	5020do			
0800	0900		South Korea, R Korea Intl	9570au	13670eu		
0800	0900		Sri Lanka, Sri Lanka BC Corp	6130do			
0800	0900		Uganda, Radio	5026do	7110do	7196do	
0800	0900		UK, BBC World Service	6190af 12095eu 15565eu 21660as	9740as 15360as 17640eu	11940af 15400af 17760as	11955pa 15485eu 17830af
0800	0900	as	UK, BBC World Service	15310as	17885af	21830va	
0800	0900		USA, Armed Forces Radio	42278va 6350va 10940va 16847va	4319va 6458va 12579va	4993va 6847va 12689va	5765va 10320va 13362va
0800	0900		USA, KAIJ Dallas TX	5755va			
0800	0900		USA, KNLS Anchor Point AK	9615as			
0800	0900		USA, KTBN Salt Lake City UT	7510na			
0800	0900		USA, KWHR Naelehu HI	11565pa	17780as		
0800	0900		USA, Voice of America	11775as	13610as	15150as	
0800	0900		USA, WEWN Birmingham AL	5825va	7425na		
0800	0900		USA, WHRA Greenbush ME	7435af			
0800	0900		USA, WHRI Noblesville IN	7315sa			
0800	0900		USA, WJCR Upton KY	7490va	13595as		
0800	0900		USA, WMLK Bethel PA	7555va	9475alt		
0800	0900		USA, WRMI Miami FL	7385am			
0800	0900		USA, WSHB Cypress Crk SC	7535eu	9845pa		
0800	0900		USA, WTJC Newport NC	9370na			
0800	0900		USA, WWCRC Nashville TN	2390am	3210am	5070am	5935am
0800	0900	vl	Vanuatu, Radio	3945do	4960do	7260do	
0800	0900		Zambia, Christian Voice	9865do			
0800	0900	vl	Zambia, National BC Corp	6165do	6265do		
0800	0900	vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do		
0815	0900	f	Seychelles, FEBA Radio	15460as			
0820	0850	s	Germany, Trans World Radio	6045eu			
0830	0900	vl	Australia, ABC/Alice Springs	2310do			
0830	0900	vl	Australia, ABC/Katherine	2485do			
0830	0900	vl	Australia, ABC/Tennant Creek	2325do			
0830	0900	a	Austria, R Austria International	21650as	21765au		
0830	0900		Georgia, Georgian Radio	11910eu			
0830	0900		Switzerland, Swiss R International	9885as	21770af		
0840	0900	s	Armenia, Voice of	4810eu	15270eu		
0855	0900	s	Taiwan, CBS	11725as			



FREQUENCIES

0900	1000		Anguilla, Caribbean Beacon	6090am			
0900	1000	vl	Australia, ABC/Alice Springs	2310do			
0900	1000	vl	Australia, ABC/Katherine	2485do			
0900	1000	vl	Australia, ABC/Tennant Creek	2325do			
0900	1000		Australia, Radio	13605pa	21820as		
0900	1000	as	Australia, Radio	11550va	11880va	17750va	
0900	1000	vl	Botswana, Radio	7255do	9600do	7255do	
0900	1000	vl	Cameroon, RTV/Yaounde	4850do			
0900	1000		Canada, CFRX Toronto ON	6070do			
0900	1000		Canada, CFVP Calgary AB	6030do			
0900	1000		Canada, CKZN St John's NF	6160do			
0900	1000		Canada, CKZU Vancouver BC	6160do			
0900	0956		China China Radio International	11730pa	15210pa		
0900	1000	as	Costa Rica, R for Peace Intl	6970va			
0900	1000		Costa Rica, University Network	5030am	6150va	7375na	9725na
				11870va	13749af		
				11775va	21455usb		
0900	1000	mtwhf	Ecuador, HCJB	15185af			
0900	1000	as/vl	Eqt. Guinea, Radio Africa	15185af			
0900	1000	a/monthly	Finland, Scandv Weekend Radio	11690va			
0900	0945		Germany, Deutsche Welle	6140eu	6160pa	11785af	12055as
				15410af	17625pa	17770va	17800af
				17820va	17860af	21560af	
				6140eu			
0900	1000		Germany, Deutsche Welle	5985eu	5995eu		
0900	1000	a	Germany, Good News World R	5975eu	21590me		
0900	1000		Germany, Voice of Hope	3366do	4915do		
0900	0915	vl	Ghana, Ghana BC Corp	15200as	15330as		
0900	0915		Guam, Trans World Radio	3289do	5949do		
0900	1000		Guyana, Voice of	7120va			
0900	1000	vl/as	Italy, IRRS	4935do			
0900	1000		Kenya, Kenya BC Corp	4800do			
0900	1000	vl	Lesotho, Radio	4760do			
0900	1000	vl	Liberia, ELWA	6100do			
0900	1000	vl	Liberia, R Liberia International	6280af			
0900	1000		Liberia, Voice of Hope	7295do			
0900	1000	s	Malaysia, Radio	11770eu			
0900	0920		Malta, Voice of Mediterranean	9870eu			
0900	1000		Monaco, Trans World Radio	7165af	7215af		
0900	1000		Namibia, Namibian BC Corp	15175pa			
0900	1000		New Zealand, R New Zealand Int	3935do	7290do		
0900	1000		New Zealand, ZLXA	6025do			
0900	1000	vl	Nigeria, Radio/Enugu	6050do			
0900	1000	vl	Nigeria, Radio/Ibadan	4770do	6090do	7275do	9570do
0900	1000	vl	Nigeria, Radio/Kaduna	3326do	4990do		
0900	1000	vl	Nigeria, Radio/Lagos	9955as	9965as	9985as	15725as
0900	1000	vl	Palau, KHBN/Voice of Hope	4890do	9675do		
0900	1000		Papua New Guinea, NBC	15490au	17495au	17625au	17655au
0900	1000		Russia, Voice of Russia WS	21790au			
				3316do			
0900	1000		Sierra Leone, Sierra Leone BS	6150do			
0900	1000		Singapore R Corp of Singapore	5020do			
0900	1000	vl	Solomon Islands, SIBC	6130do			
0900	1000		Sri Lanka, Sri Lanka BC Corp	5026do	7110do	7196do	
0900	1000		Uganda, Radio	6190af	6195va	9605as	9740as
0900	0930		UK, BBC World Service	11760me	11765as	11940af	11945af
				11955pa	12095eu	15190sa	15310as
				15360as	15400af	15485eu	15565eu
				15575as	17640eu	17760as	17790as
				17830af	17885af	21470af	21660as
0900	0930	mtwhfa	UK, BBC World Service	11945as			
0900	1000		UK, Merlin Network One	6130eu			
0900	1000		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
				6350va	6458va	6847va	10320va
				10940va	12579va	12689va	13362va
				16847va			
				5755va			
0900	1000		USA, KAIJ Dallas TX	7510na			
0900	1000		USA, KATN Salt Lake City UT	11565pa	17780as		
0900	1000		USA, KWHR Naalehu HI	11775as	13610as	15150as	
0900	1000		USA, Voice of America	5825va	7425na		
0900	1000		USA, WEWN Birmingham AL	7435af			
0900	1000		USA, WHRA Greenbush ME	7315sa			
0900	1000		USA, WHRI Noblesville IN	7490va	13595as		
0900	1000		USA, WJCR Upton KY	7555va	9475alt		
0900	1000		USA, WMLK Bethel PA	7385am			
0900	1000		USA, WRMI Miami FL	7535eu	9455sa		
0900	1000		USA, WSHB Cypress Crk SC	9370na			
0900	1000		USA, WTJC Newport NC	2390am	3210am	5070am	5935am
0900	1000	vl	USA, WWCR Nashville TN	3945do	4960do	7260do	
0900	1000		Vanuatu, Radio	9865do			
0900	1000	vl	Zambia, Christian Voice	6165do	6265do		
0900	1000	vl	Zambia, National BC Corp	5975do	6045do		
0900	1000	vl	Zimbabwe, Zimbabwe BC Corp	6130do	4915do		
0915	1000	vl/as	Ghana, Ghana BC Corp	4915do	4915do		
0915	0930		Ghana, Ghana BC Corp	15330as			
0920	0950	s	Guam, Trans World Radio	9870eu			
0930	1000		Georgia, Georgian Radio	11910me			
0930	1000	mtwhf	Guam, Trans World Radio	15330as			
0930	1000		Netherlands, Radio	7260va	9790va	12065va	
0930	1000		UK, BBC World Service	6190af	6195as	9740as	11760me
				11940af	11945as	11955pa	12095eu
				15190sa	15310as	15400af	15485eu
				15565eu	15575as	17640eu	17760as
				17790as	17830af	17885af	21470af
				21660as			

1000	1100		Anguilla, Caribbean Beacon	11775am			
1000	1100	vl	Australia, ABC/Alice Springs	2310do			
1000	1100		Australia, ABC/Katherine	2485do			
1000	1100	vl	Australia, ABC/Tennant Creek	2325do			
1000	1100		Australia, Radio	11880va	13605pa	17750as	21820as
1000	1100	as	Bhutan, Bhutan BC Service	6035do			
1000	1100	vl	Botswana, Radio	7255do	9600do	7255do	
1000	1100	vl	Cameroon, RTV/Yaounde	4850do			
1000	1100		Canada, CFRX Toronto ON	6070do			
1000	1100		Canada, CFVP Calgary AB	6030do			
1000	1100		Canada, CKZN St John's NF	6160do			
1000	1100		Canada, CKZU Vancouver BC	6160do			
1000	1056		China China Radio International	11730pa	15210pa		
1000	1100	as	Costa Rica, R for Peace Intl	6970va			
1000	1100		Costa Rica, University Network	5030am	6150va	7375na	9725na
				11870va	13749af		
				21745va			
1000	1100		Czech Rep, Radio Prague Intl	11755pa	21455usb		
1000	1100		Ecuador, HCJB	15185af			
1000	1100	mtwhf	Eqt Guinea, Radio Africa	15185af			
1000	1100	as/vl	Eqt. Guinea, Radio East Africa	15185af			
1000	1100	a/monthly	Finland, Scandv Weekend Radio	11690va			
1000	1100		Germany, Deutsche Welle	6140eu			
1000	1100		Germany, Voice of Hope	5975eu	21590me		
1000	1100	vl	Ghana, Ghana BC Corp	6130do	4915do		
1000	1100	vl/as	Ghana, Ghana BC Corp	4915do	4915do		
1000	1100		Guyana, Voice of	5949do			
1000	1100		India, All India Radio	11585as	13700au	15020as	17485au
				17840as	17895au		
				7120va			
1000	1100	vl/as	Italy, IRRS	9695as	15590as	21570pa	
1000	1100		Japan, Radio	4935do			
1000	1100		Kenya, Kenya BC Corp	4800do			
1000	1100	vl	Lesotho, Radio	4760do			
1000	1100	vl	Liberia, ELWA	6100do			
1000	1100	vl	Liberia, R Liberia International	11530af			
1000	1100		Liberia, Voice of Hope	7295do			
1000	1100		Malaysia, Radio	11870as			
1000	1100		N Marianas, KHBI Saipan	7165af	7215af		
1000	1100		Namibia, Namibian BC Corp	7260va	9790va	12065va	
1000	1100		Netherlands, Radio	15175pa			
1000	1100		New Zealand, R New Zealand Int	3935do			
1000	1100		New Zealand, ZLXA	6025do			
1000	1100	vl	Nigeria, Radio/Enugu	6050do			
1000	1100	vl	Nigeria, Radio/Ibadan	4770do	6090do	7275do	9570do
1000	1100	vl	Nigeria, Radio/Kaduna	4990do	7285do		
1000	1100	vl	Nigeria, Radio/Lagos	7255af	15120af		
1000	1100	vl	Nigeria, Voice of	9955as	9965as	9985as	15725as
1000	1100		Palau, KHBN/Voice of Hope	4890do	9675do		
1000	1100	vl	Papua New Guinea, NBC	15490au	17495au	17625au	17655au
1000	1100		Sierra Leone, Sierra Leone BS	5980do			
1000	1100		Singapore R Corp of Singapore	6150do			
1000	1030		Singapore, RTE Radio	11740au			
1000	1100	vl	Solomon Islands, SIBC	5020do			
1000	1030		Sri Lanka, Sri Lanka BC Corp	4940do			
1000	1100		Uganda, Radio	5026do	7110do	7196do	
1000	1100		UK, BBC World Service	5965na	6190af	6195va	9740as
				11760me	11940af	11955pa	12095eu
				15310as	15360as	15485eu	15565eu
				15575as	17640eu	17760as	17790as
				17885af	21470af	21660as	
				15190sa	15400af	17830af	
1000	1100	as	UK, BBC World Service	4278va	4319va	4993va	5765va
1000	1100		USA, Armed Forces Radio	6350va	6458va	6847va	10320va
				10940va	12579va	12689va	13362va
				16847va			
				5755va			
1000	1100		USA, KAIJ Dallas TX	7510na			
1000	1100		USA, KATN Salt Lake City UT	11565pa	17780as		
1000	1100		USA, KWHR Naalehu HI	11775as	13610as	15150as	
1000	1100		USA, Voice of America	5825va	7425na		
1000	1100		USA, WEWN Birmingham AL	7435af			
1000	1100		USA, WHRI Noblesville IN	7315sa			
1000	1100		USA, WJCR Upton KY	7490va	13595as		
1000	1100		USA, WRMI Miami FL	7555va	9475alt		
1000	1100		USA, WSHB Cypress Crk SC	7385am			
1000	1100		USA, WTJC Newport NC	7535eu	9455sa		
1000	1100	vl	USA, WWCR Nashville TN	9370na			
1000	1100	vl	USA, WYFR Okesechobee FL	2390am	3210am	5070am	5935am
1000	1100		Vanuatu, Radio	3945do	4960do	7260do	
1000	1027		Vietnam, Voice of	9839as	12019as		
1000	1100		Zambia, Christian Voice	9865do			
1000	1100	vl	Zambia, National BC Corp	6165do	6265do		
1000	1100	vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do		
1030	1045	mtwhf	Ethiopia, Radio	5990do	7110do	9705do	
1030	1100		Guam, Adventist World Radio	11795as			
1030	1100		Malaysia, RTM Sarawak	7160do			
1030	1100		Mongolia, Voice of	12085au			
1030	1100		South Korea, R Korea Intl	11715na			
1030	1100		Sri Lanka, Sri Lanka BC Corp	4940do	11835as	15120as	17850as
1030	1100		UAE, Radio Dubai	13675eu	15370eu	15395eu	21605eu



FREQUENCIES

1100	1200		Anguilla, Caribbean Beacon	11775am				1100	1200		Switzerland, Swiss R International	9540as	21770as		
1100	1200	vl	Australia, ABC/Alice Springs	2310do				1100	1200		Taiwan, Voice of Asia	7445as			
1100	1200	vl	Australia, ABC/Katherine	2485do				1100	1200		Uganda, Radio	5026do	7110do	7196do	
1100	1200	vl	Australia, ABC/Tennant Creek	2325do				1100	1130	mtwhf	UK, BBC Caribbean Report	6195ca	15220ca		
1100	1200		Australia, Radio	5995pa	6020pa	9580va	11650pa	1100	1130	as	UK, BBC World Service	5965na	6195as	9580as	9740as
				13605pa	21820as							11760me	11955as	12095seu	15280as
1100	1200	vl	Botswana, Radio	7255do								15220am	15310as	15400af	15485seu
1100	1200	vl	Cameroon, RTV/Yaounde	4850do								15565seu	15575as	17640as	17700as
1100	1200		Canada, CBC Northern Service	9625do								17790sa	17830af	17885af	21470af
1100	1200		Canada, CFRX Toronto ON	6070do				1100	1130	as	UK, BBC World Service	6195na	15190sa	15220am	
1100	1200		Canada, CFVP Calgary AB	6030do				1100	1200	mtwhfa	UK, BBC World Service	6190af	11940af		
1100	1200		Canada, CKZN St John's NF	6160do				1100	1200	a	UK, Flat Earth Radio/Merlin	21455me	21515af		
1100	1200		Canada, CKZU Vancouver BC	6160do				1100	1200	a	UK, Virgin Radio/Merlin	21455me	21515af		
1100	1200	mtwhf	Canada, R Canada International	9640na				1100	1200		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
1100	1200	as	Costa Rica, R for Peace Intl	6970va	13650na	17765na	17820na					6350va	6458va	6847va	10320va
1100	1200		Costa Rica, University Network	5030am	6150va	7375na	9725na					10940va	12579va	12689va	13362va
				11870va	13749af							16847va			
1100	1200		Ecuador, HCJB	12005am				1100	1200		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
1100	1200	mtwhf	Eqt Guinea, Radio Africa	15185af								6350va	6458va	6847va	10320va
1100	1200	as/vl	Eqt. Guinea, Radio East Africa	15185af								10940va	12579va	12689va	13362va
1100	1200	a/monthly	Finland, Scandv Weekend Radio	11690va								16847va			
1100	1200		Germany, Deutsche Welle	6140eu	15410af	17800af	21780af	1100	1200		USA, KAIJ Dallas TX	5755va			
1100	1200		Germany, Voice of Hope	21590me				1100	1200		USA, KTVN Salt Lake City UT	7510na			
1100	1200	vl	Ghana, Ghana BC Corp	6130do	4915do			1100	1200		USA, KQHR Naalehu HI	9930as	11565pa		
1100	1200	vl/as	Ghana, Ghana BC Corp	4915do	4915do			1100	1130	mtwhf	USA, Voice of America	13675af	15550af	17650af	17780af
1100	1200		Guyana, Voice of	5949do								21600af			
1100	1200		Iran, VOIRI	15185as	15385as	15585as	21470as	1100	1200		USA, Voice of America	6160as	9645as	9760as	9770pa
				21730as								15160as	15240as	15425as	
1100	1200	vl/as	Italy, IRRS	7120va				1100	1200		USA, WEWN Birmingham AL	5825na	7425na	15745na	
1100	1200		Japan, Radio	6120na	9695as	15590as		1100	1200		USA, WHRI Noblesville IN	6040na	9495sa		
1100	1200		Jordan, Radio	17680eu				1100	1200		USA, WJCR Upton KY	7490va	13595as		
1100	1200		Kenya, Kenya BC Corp	4935do				1100	1200		USA, WRMI Miami FL	9955am			
1100	1200	vl	Lesotho, Radio	4800do				1100	1200		USA, WSHB Cypress Crk SC	6095am	11660va		

SELECTED PROGRAMS

*special Caribbean service on 6195, 15220 kHz.

Daily

1100	BBC (all)	World Briefing, News
1120	BBC (all)	British News

Sundays

1101	BBC (As)	Concert Hall (classical)
1130	BBC (Am, Af, Eu, Me)	Arts in Action (global magazine)
1130	BBC (As/Pa/Au)	Play of the Week (contemporary drama)
1130	BBC (Af)	Postmark Africa (expert answers any question)

Mondays

1105	BBC (Am)*	Caribbean Report (regional news/business)
1105	BBC (As/Pa/Au)	Health Matters (news/keeping fit)
1105	BBC (Af)	Discovery (scientific trends/research)
1110	BBC (Am)*	Caribbean Sport
1115	BBC (Am)*	Caribbean Magazine (regional reports)
1130	BBC (Eu/Af)	World Business Report
1130	BBC (Me)	~World Learning (various educational series)
1130	BBC (Am)	World Business Report
1130	BBC (As/Pa/Au)	Everywoman (int'l women's magazine)
1130	BBC (Af)	Essential Guide (background on our world)
1130	BBC (As)	Letter from America (Alistair Cooke)
1130	BBC (As)	World Business Report
1130	BBC (Af)	Inside Track
1145	BBC (Eu/Af/Am/As)	Sports Roundup

Tuesdays

1105	BBC (Am)*	Caribbean Report (regional news/business)
1105	BBC (As/Pa/Au)	Science View (astronomy/discoveries)
1105	BBC (Af)	Health Matters (medical news/keeping fit)
1110	BBC (Am)*	Caribbean Sport

1115	BBC (Am)	Caribbean Magazine (regional reports)
1130	BBC (Eu/ Af/ Am/ As)	World Business Report
1130	BBC (Me)	World Learning (various educational series)
1130	BBC (As/Pa/Au)	Focus on Faith (religious issues)
1130	BBC (Af)	Everywoman (int'l women's magazine)
1130	BBC (Af)	Analysis of a current event/issue)
1145	BBC (most)	Sports Roundup

Wednesdays

1105	BBC (Am)*	Caribbean Report (regional news/business)
1105	BBC (As/Pa/Au)	Focus on Football (global soccer) [1st wk.] Sports International (anthologies) [exc. 1st wk.]
1105	BBC (Af)	Science View (astronomy/discoveries/computing/trends)
1110	BBC (Am)*	Caribbean Sport
1115	BBC (Am)*	Caribbean Magazine (regional reports)
1130	BBC (Eu/Af/Am/As)	World Business Report
1130	BBC (Me)	World Learning (various educational series)
1130	BBC (As/Pa/Au)	Pick of the World (WS highlights)
1130	BBC (Af)	Focus on Faith (religious issues)
1130	BBC (Af)	Analysis (of a current event/issue)
1145	BBC (most)	Sports Roundup

Thursdays

1105	BBC (Am)*	Caribbean Report (regional news/business)
1105	BBC (As/Pa/Au)	One Planet (development and environment)
1105	BBC (Af)	Focus on Football (global soccer) [1st wk.] Sports International (anthologies) [exc. 1st wk.]
1110	BBC (Am)*	Caribbean Sport
1115	BBC (Am)*	Caribbean Magazine (regional reports)
1130	BBC (Eu/As/ Am/ As)	World Business Report
1130	BBC (Me)	World Learning (various educational series)
1130	BBC (As/Pa/Au)	People and Places (global views/experiences)
1130	BBC (Af)	Pick of the World (World Service highlights)
1130	BBC (Af)	From Our Own Correspondent (backround to news)

1145 BBC (most) Sports Roundup

Fridays

1105	BBC (Am)*	Caribbean Report (regional news/business)
1105	BBC (As/Pa/Au)	Discovery (scientific ideas/research)
1105	BBC (Af)	One Planet (development and environment)
1110	BBC (Am)*	Caribbean Sport
1115	BBC (Am)*	Caribbean Magazine (regional reports)
1130	BBC (Eu/Af/ Am/ As)	World Business Report
1130	BBC (Me)	World Learning (various educational series)
1130	BBC (As/Pa/Au)	Essential Guide (background on our world)
1130	BBC (Af)	People and Places (global views/experiences)
1130	BBC (Af)	Analysis (of a current event/issue)
1145	BBC (Eu/Af)	Sports Roundup
1145	BBC (Am/As)	Football Extra (global soccer weekly)

Saturdays

1105	BBC (Af)	Westway Omnibus (last week's 2 episodes)
1105	BBC (As)	The Edge (youth magazine)[cont'd from 1005]
1130	BBC (Eu/Ef/Am)	World Business Rev (financial news)[exc. last wk.]
1130	BBC (As/Pu/Au)	Science in Action (typical research reports)
1130	BBC (Eu/Ef)	The New Europe (integration efforts)[last wk.]
1130	BBC (Af)	Analysis (of a current event/issue)
1135	BBC (Af)	Greenfield Collection (classical music requests)
1145	BBC (Am/ Af)	Sports Roundup



SELECTED PROGRAMS

B-00 in English, all via Plovdiv site, with kW and azimuths:
 0000-0100 NAm 7400 500/295, 9400 500/306
 0300-0400 NAm 7400 500/295, 9400 500/306
 1200-1300 WEu 15700 500/306, 17500 250/292
 2000-2100 WEu 7200 500/295, 7500 500/306
 2200-2300 WEu 7200 500/295, 7500 500/306
 (Observer, Bulgaria via DXLD)



FREQUENCIES

1400 1500	Anguilla, Caribbean Beacon	11775am				1400 1500	Palau, KHBN/Voice of Hope	9955as	9965as	9985as	13840as
1400 1500 vl	Australia, ABC/Alice Springs	2310do				1400 1455 as	S Africa, Channel Africa	11720af	17780af	21725af	
1400 1500 vl	Australia, ABC/Katherine	2485do				1400 1500	Sierra Leone, Sierra Leone BS	5980do			
1400 1500 vl	Australia, ABC/Tennant Creek	2325do				1400 1500	Singapore R Corp of Singapore	6150do			
1400 1500	Australia, Radio	5995as	6080va	9475as	9580va	1400 1500	Sri Lanka, Sri Lanka BC Corp	4940do	6005as	6075as	9770as
		11650pa	11660as					15425as			
1400 1500 vl	Botswana, Radio	7255do		7255do		1400 1500	Switzerland, Swiss R International	12010as	15185as		
1400 1500 vl	Cameroon, RTV/Yaounde	4850do				1400 1500	Taiwan, R Taiwan International	15125as			
1400 1500 vl	Canada, CBC Northern Service	9625do				1400 1430	Thailand, Radio	9655as	9830as	11905as	
1400 1500	Canada, CFRX Toronto ON	6070do				1400 1430	Turkey, Voice of	17690as	17815eu		
1400 1500	Canada, CFVP Calgary AB	6030do				1400 1500	Uganda, Radio	4976do	5026do		
1400 1500	Canada, CKZN St John's NF	6160do				1400 1500	UK, BBC World Service	5990as	6190af	6195as	9515na
1400 1500	Canada, CKZU Vancouver BC	6160do						9740as	11865na	11940af	12095eu
1400 1500 s	Canada, R Canada International	13650na	17800na					15310as	15485eu	15565eu	15575me
1400 1456	China China Radio International	7405na	9700as	11675as	11825as			17700as	17830af	17840am	21470af
			15110as	15125af		1400 1500 a	UK, Flat Earth Radio/Merlin	15665na	21455me	21455me	21515af
1400 1500	Costa Rica, R for Peace Intl	15050va	21815va			1400 1500 a	UK, Virgin Radio/Merlin	21455me	21515af		
1400 1500	Costa Rica, University Network	5030am	6150va	7375na	9725na	1400 1500	USA, Armed Forces Radio	4278va	4319va	4993va	5765va
		11870va	13749af					6350va	6458va	6847va	10320va
								12579va	12689va	13362va	16847va
1400 1429	Czech Rep, Radio Prague Intl	21745a				1400 1500	USA, KAIJ Dallas TX	13815va			
1400 1500	Ecuador, HCJB	12005am	15115va	21455usb		1400 1500	USA, KJES Vado NM	11715na			
1400 1500 as/vl	Eqt. Guinea, Radio East Africa	15185af				1400 1500	USA, KTBN Salt Lake City UT	7510na			
1400 1500 a/monthly	Finland, Scandv Weekend Radio	11690va				1400 1500	USA, KWHR Naalehu HI	9930as	11565as		
1400 1500 a/monthly	Finland, Scandv Weekend Radio	11720va				1400 1430 s	USA, Voice of America	18275va			
1400 1500	France, R France International	11610as	17620va	17680as		1400 1500	USA, Voice of America	6160as	7125as	9645as	9760as
1400 1500	Germany, Deutsche Welle	6140eu						15160as	15255va	15425as	
1400 1500	Germany, Overcomer Ministries	6110eu				1400 1500	USA, WEWN Birmingham AL	11875va	15375na	15745na	
1400 1500	Germany, Voice of Hope	15715me	17550as			1400 1500	USA, WGTG McCaysville GA	9400am	12170am		
1400 1500 vl	Ghana, Ghana BC Corp	4915do	6130do			1400 1500	USA, WHRI Noblesville IN	6040na	15105na		
1400 1500	Guyana, Voice of	5949do				1400 1500	USA, WJCR Upton KY	7490va	13595as		
1400 1500	India, All India Radio	9710as	11620as	13710as		1400 1500	USA, WRMI Miami FL	15725am			
1400 1500 vl/as	Italy, IRRS	7120va				1400 1500	USA, WTJC Newport NC	9370na			
1400 1500	Japan, Radio	9505na	9860as	11730as	11880me	1400 1500	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1400 1500	Jordan, Radio	11690eu				1400 1500	USA, WYFR Okeechobee FL	11550as	11830na	11970na	17750na
1400 1500	Kenya, Kenya BC Corp	4935do				1400 1405	vatican Cy, Vatican Radio	17515au	21620au		
1400 1500 vl	Lesotho, Radio	4800do				1400 1500	Zambia, Christian Voice	9865do			
1400 1500 vl	Liberia, ELWA	4760do				1400 1500 vl	Zambia, National BC Corp	6165do	6265do		
1400 1500 vl	Liberia, R Liberia International	6100do				1400 1500 vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do		
1400 1500	Liberia, Voice of Hope	11530af				1415 1420	Nepal, Radio	5005as	7165as		
1400 1500	Malaysia, Radio	7295do				1430 1500	Guam, Adventist World Radio	9355as			
1400 1500	Malaysia, RTM Sarawak	7160do				1430 1500	Guam, Trans World Radio	15330as			
1400 1500	Namibia, Namibian BC Corp	7165af	7215af			1430 1500	Malaysia, RTM Kota Kinabalu	5980do			
1400 1500 occsnal	New Zealand, R New Zealand Int	6095pa				1430 1500	Myanmar, Radio	5985do			
1400 1500 vl	New Zealand, ZLXA	3935do				1430 1500	Netherlands, Radio	12070as	12090as	15595as	
1400 1500 vl	Nigeria, Radio/Enugu	6025do				1430 1500	Slovakia, Adventist World Radio	17525as			
1400 1500 vl	Nigeria, Radio/Ibadan	6050do				1430 1500	Sweden, Radio	17505va	18960na		
1400 1500 vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do	1455 1500	Israel, Kol Israel	15650va	17545va		
1400 1500 vl	Nigeria, Radio/Lagos	4990do	7285do								
1400 1500	Oman, Radio Sultanate of	15140va									

SELECTED PROGRAMS

Sundays

1400	BBC (all)	News
1405	BBC (all)	Talking Point (global current affairs phone-in)

Monday-Friday

1400	BBC (most)	News
1400	BBC (E Af)	World Briefing
1400	BBC (As/Pa/Aus)	East Asia Today (regional current events magazine)

Mondays

1405	BBC (Eu/N Af)	Meridian-Masterpiece (best performances)
1405	BBC (Me/ W&S Af)	Discovery (scientific ideas/trends/research)
1405	BBC (Am/As)	Meridian-Ideas (cultural trends/thought)
1420	BBC (E Af)	World Business Report
1430	BBC (Eu/N Af)	Panel game/Quiz show (rotating series)
1430	BBC (Me)	Essential Guide (backgrounding aspects of our world)
1430	BBC (Am/As)	Music Mix (showcasing popular music genres)
1430	BBC (As/Pa/Aus/ E Af)	British News
1430	BBC (W&S Af)	Essential Guide (backgrounding aspects)
1445	BBC (As/Pa/Aus/ E Af)	Sports Roundup

Tuesdays

1405	BBC (Eu/N Af)	Meridian-Ideas (cultural trends/thought)
1405	BBC (Me/ W&S Af)	Health Matters (medical news/keeping fit)
1405	BBC (Am/As)	Meridian-Screen (int'l film/cinema)
1420	BBC (E Af)	World Business Report
1430	BBC (Eu/N Af)	Music Mix (popular music genres)
1430	BBC (Me/ W&S Af)	Everywoman (int'l women's magazine)
1430	BBC (Am)	UK Top 20 (British top hits)
1430	BBC (As/Pa/Aus/ E Af)	British News
1430	BBC (As)	UK Top 20 (British top hits)
1445	BBC (As/Pa/Aus/ E Af)	Sports Roundup

Wednesdays

1405	BBC (Eu/N Af)	Meridian-Screen (int'l film/cinema)
1405	BBC (Me/ W&S Af)	Science View (astronomy/computing/trends)
1405	BBC (Am/As)	Meridian-Music (classical music trends)
1420	BBC (E Af)	World Business Report
1430	BBC (Eu/N Af)	UK Top 20 (British top hits)
1430	BBC (Me)	Focus on Faith (religious issues)
1430	BBC (Am/ As)	Westway (drama serial)
1430	BBC (As/Pa/Aus/ E Af)	British News
1430	BBC (W&S Af)	Focus on Faith (religious issues)
1445	BBC (Am/As)	UK Album Chart (top selling British CDs)
1445	BBC (As/Pa/Aus/ E Af)	Sports Roundup

Thursdays

1405	BBC (Eu/N Af)	Meridian-Music (classical music trends)
1405	BBC (Me/ W&S Af)	Focus on Football (global soccer)[1st wk.]
1405	BBC (Me/ W&S Af)	Sports Int'l (anthologies)[exc. 1st wk.]
1405	BBC (Am/As)	Meridian-Writing (examining contemporary literature)
1420	BBC (E Af)	World Business Report
1430	BBC (Eu/N Af)	Omnibus (documentary)
1430	BBC (Me/ W&S Af)	Pick of the World (World Service highlights)
1430	BBC (Am/ As)	World Music (showcasing global music trends)
1430	BBC (As/Pa/Aus/ E Af)	British News
1445	BBC (Am)	Music X-Press (trend-setting popular music)
1445	BBC (As/Pa/Aus/ E Af)	Sports Roundup

Fridays

1405	BBC (Eu/N Af)	Meridian-Writing (examining contemporary literature)
1405	BBC (Me/ W&S Af)	One Planet (development and the environment)
1405	BBC (Am/As)	Meridian-Masterpiece (showcasing best performances)
1420	BBC (E Af)	World Business Report
1430	BBC (Eu/N Af)	World Music (showcasing global music trends)
1430	BBC (Me)	People and Places (forum for global views/experiences)

1430	BBC (Am)	Westway (drama serial)
1430	BBC (As/Pa/Aus/ E Af)	British News
1430	BBC (As)	Westway (drama serial)
1430	BBC (W&S Af)	People and Places (forum for global views/experiences)
1445	BBC (Am)	Music X-Press (trend-setting popular music)
1445	BBC (As/Pa/Aus)	Sports Roundup
1445	BBC (E Af)	Football Extra (weekly global soccer report)
1445	BBC (As)	Music X-Press (trend-setting popular music)

Saturdays

1400	BBC (most)	News
1400	BBC (As/Pa/Aus)	East Asia Today (regional current events magazine)
1405	BBC (all)	Sportsworld (play-by-play/ reports) [to 1700]

PROPAGATION FORECASTING

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Gloucester K1J1A7 Canada

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1500	1600		Anguilla, Caribbean Beacon	11775am				1500	1600	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
1500	1600	vl	Australia, ABC/Alice Springs	2310do				1500	1600	vl	Nigeria, Radio/Lagos	4990do	7285do		
1500	1600		Australia, ABC/Katherine	2485do				1500	1600	vl	Nigeria, Voice of	7255af	15120af		
1500	1600	vl	Australia, ABC/Tennant Creek	2325do				1500	1556		North Korea, R Pyongyang	4405va	6574na	9335na	11710na
1500	1600		Australia, Radio	5995as	6080va	9475as	9580va					13760na			
				11650pa	11660as			1500	1600		Palau, KHBN/Voice of Hope	9955as	9965as	9985as	13840as
1500	1530		Austria, R Austria International	17865na				1500	1600		Russia, Voice of Russia WS	11695as	11720as	12055me	
1500	1600	vl	Botswana, Radio	7255do	9600do	7255do		1500	1530		S Africa, Channel Africa	17770af			
1500	1600	vl	Cameroon, RTV/Yaounde	4850do				1500	1600		Seychelles, FEBA Radio	11600as			
1500	1600	vl	Canada, CBC Northern Service	9625do				1500	1600		Sierra Leone, Sierra Leone BS	5980do			
1500	1600		Canada, CFRX Toronto ON	6070do				1500	1600		Singapore R Corp of Singapore	6150do			
1500	1600		Canada, CFVP Calgary AB	6030do				1500	1600		Sri Lanka, Sri Lanka BC Corp	4940do	6005as	6075as	9770as
1500	1600		Canada, CKZN St John's NF	6160do								15425as			
1500	1600		Canada, CKZU Vancouver BC	6160do				1500	1600		Uganda, Radio	4976do	5026do		
1500	1559	s	Canada, R Canada International	13650na	17800na			1500	1600		UK, BBC World Service	5975as	5990as	6190af	6195as
1500	1556		China China Radio International	7160as	7405na	9785as	13685af					9515na	9740as	11865na	11940af
				15125af								12095eu	15220na	15310as	15400af
1500	1600		Costa Rica, R for Peace Intl	15050va	21815va							15485eu	15575eu	17700as	15420af
1500	1600		Costa Rica, University Network	5030am	6150va	7375na	9725na					21470af	21490af	21660af	17840am
				11870va	13749af			1500	1600	a	UK, Flat Earth Radio/Merlin	15665na	21455me	21515af	
1500	1530		Ecuador, HCJB	21455usb				1500	1600	a	UK, Virgin Radio/Merlin	21455me	21515af		
1500	1600	as/vl	Ecuador, HCJB	12005am	15115va			1500	1600		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
1500	1600	a/monthly	Eqt. Guinea, Radio East Africa	15185af							6350va	6458va	6847va	10320va	10940va
1500	1600		Finland, Scandv Weekend Radio	11720va							12579va	12689va	13362va	16847va	
1500	1600		Germany, Deutsche Welle	6140eu				1500	1600		USA, KAJJ Dallas TX	13815va			
1500	1600		Germany, Overcomer Ministries	6110eu	13810af			1500	1600		USA, KJES Vado NM	11715na			
1500	1600		Germany, Voice of Hope	15715me	17550as			1500	1600		USA, KTBN Salt Lake City UT	7510na			
1500	1600	vl	Ghana, Ghana BC Corp	4915do	6130do			1500	1600		USA, KWHR Naalehu HI	9930as	11565pa		
1500	1600		Guam, Trans World Radio	15330as				1500	1600		USA, VOA Special English	6160as	9760as	9845as	12040as
1500	1600		Guyana, Voice of	5949do								15235as			
1500	1530		Israel, Kol Israel	15650va	17545va			1500	1600		USA, Voice of America	7125as	9645as	9700me	9780as
1500	1600	vl/as	Italy, IRRS	7120va								15205va	15255va		
1500	1600		Japan, Radio	9750as	9860as	11730as		1500	1600		USA, WEWN Birmingham AL	11875va	15375na	15745na	
1500	1600		Jordan, Radio	11690eu				1500	1600		USA, WGTG McCaysville GA	9400am	12170am		
1500	1600		Kenya, Kenya BC Corp	4935do				1500	1600		USA, WHRI Noblesville IN	6040na	15105na		
1500	1600	vl	Lesotho, Radio	4800do				1500	1600		USA, WJCR Upton KY	7490va	13595as		
1500	1600	vl	Liberia, ELWA	4760do				1500	1600		USA, WRMI Miami FL	15725am			
1500	1600	vl	Liberia, R Liberia International	6100do				1500	1600		USA, WTJC Newport NC	9370na			
1500	1600		Liberia, Voice of Hope	11530af				1500	1600		USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1500	1600		Malaysia, Radio	7295do				1500	1600		USA, WYFR Okeechobee FL	11830na	17750na		
1500	1600		Malaysia, RTM Kota Kinabalu	5980do				1500	1600		Zambia, Christian Voice	4965do			
1500	1600		Malaysia, RTM Sarawak	7160do				1500	1600	vl	Zambia, National BC Corp	6165do	6265do		
1500	1530		Mexico, R Mexico International	9705am	11770alt			1500	1600	vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do		
1500	1600		Mongolia, Voice of	12015as	12085as			1515	1600	vl	Malawi, Malawi BC Corp	3380do			
1500	1600		Myanmar, Radio	5985do				1530	1545		Afghanistan, Voice of Shari'ah	7002do	7073do	7085as	
1500	1600		Namibia, Namibian BC Corp	7165af	7215af			1530	1545		Bangladesh, Bangla Betar	4862as	15520as		
1500	1600		Netherlands, Radio	12070as	12095as	15595as		1530	1600	vl	Botswana, Radio	3356do	4820do	7255do	
1500	1600	occnsal	New Zealand, R New Zealand Int	6095pa				1530	1600		Iran, VOIRI	7115as	9635as	11775na	
1500	1600		New Zealand, ZLXA	3935do				1530	1600		S Africa, World Beacon	6145af			
1500	1600	vl	Nigeria, Radio/Enugu	6025do				1545	1600	sh	Bangladesh, Bangla Betar	4882as	15520as		
1500	1600	vl	Nigeria, Radio/Ibadan	6050do				1550	1600		Vatican City, Vatican Radio	12065au	13765au	17730au	

SELECTED PROGRAMS

1500	BBC (All)	News
1500	BBC (S As)	News Summary
1501	BBC (E Af)	Play of the Week (contemporary radio drama)
1501	BBC (ME)	Concert Hall (classical music recitals)
1501	BBC (S As)	Play of the Week (contemporary radio drama)
1501	BBC (W&S Af)	Play of the Week (contemporary radio drama)
1505	BBC (Am)	From Our Own Correspondent
1505	BBC (E As/Pa/Au)	The Alternative ("leading edge" music)
1505	BBC (Eu/N Af)	From Our Own Correspondent
1530	BBC (Am)	People and Politics (the week in Parliament)
1530	BBC (E As/Pa/Au)	Omnibus (documentary)
1530	BBC (Eu/N Af)	People and Politics (the week in Parliament)

1500	BBC (All)	News
1500	BBC (ME)	World Briefing
1500	BBC (S As)	World Briefing
1505	BBC (Eu/N Af)	Discovery (scientific ideas/trends/research)
1505	BBC (Am)	One Planet (development and the environment)
1505	BBC (E As/Pa/Au)	Meridian-Ideas (cultural trends/thought)
1505	BBC (E Af)	Focus on Africa (regional correspondents' reports)
1505	BBC (WES Af)	Focus on Africa (regional correspondents' reports)
1530	BBC (Eu/N Af)	Essential Guide (backgrounding aspects of our world)
1530	BBC (ME)	British News
1530	BBC (Am)	People and Places (global views/experiences)
1530	BBC (E As/Pa/Au)	Mix Music (showcasing popular music genres)
1530	BBC (E Af)	World Learning (various educational series)
1530	BBC (S As)	British News
1530	BBC (WES Af)	World Learning (various educational series)
1545	BBC (ME)	Sports Roundup
1545	BBC (S As)	World Business Report

1500	BBC (All)	News
1500	BBC (ME)	World Briefing

1505	BBC (Eu/N Af)	health matters (medical news/keeping fit)
1505	BBC (Am)	Discovery (scientific ideas/trends/research)
1505	BBC (E As/Pa/Au)	Meridian-Screen (international film/cinema)
1505	BBC (E Af)	Focus on Africa (regional correspondents' reports)
1505	BBC (WBS Af)	Focus on Africa (regional correspondents' reports)
1530	BBC (Eu/N Af)	Everywoman (international women's magazine)
1530	BBC (ME)	British News
1530	BBC (Am)	Essential Guide (backgrounding aspects of our world)
1530	BBC (E As/Pa/Au)	UK Top 20 (British top hits)
1530	BBC (E Af)	World Learning (various educational series)
1530	BBC (S As)	British News
1530	BBC (WBS Af)	World Learning (various educational series)
1545	BBC (ME)	Sports Roundup
1545	BBC (S As)	World Business Report

1500	BBC (All)	News
1500	BBC (ME)	World Briefing
1500	BBC (S As)	World Briefing
1505	BBC (Eu/N Af)	Science View (astronomy/discoveries/computing/trends)
1505	BBC (Am)	Health Matters (medical news/keeping fit)
1505	BBC (E As/Pa/Au)	Meridian-Music (classical music trends)
1505	BBC (E Af)	Focus on Africa (regional correspondents' reports)
1505	BBC (W/S Af)	Focus on Africa (regional correspondents' reports)
1530	BBC (Eu/N Af)	Focus on Faith (religious issues)
1530	BBC (ME)	British News
1530	BBC (Am)	Everywoman (international women's magazine)
1530	BBC (E As/Pa/Au)	Westway (drama serial)
1530	BBC (E,W,S Af)	World Learning (various educational series)
1530	BBC (S As)	British News
1545	BBC (E As/Pa/Au)	UK Album Chart (top selling British CDs)
1545	BBC (ME)	Sports Roundup
1545	BBC (S As)	World Business Report

1500 BBC (All) News

1505	BBC (Eu/N Af)	Focus on Football (global soccer)[1st wk.]
1505	BBC (Eu/N Af)	Sports International (anthologies)[exc. 1st wk.]
1505	BBC (Am)	Science View (astronomy/discoveries/computing)
1505	BBC (E As/Pa/Au)	Meridian-Writing (examining literature)
1505	BBC (E,W,S Af)	Focus on Africa (regional correspondents' reports)
1530	BBC (Eu/N Af)	Pick of the World (World Service highlights)
1530	BBC (ME/S As)	British News
1530	BBC (Am)	Focus on Faith (religious issues)
1530	BBC (E As/Pa/Au)	World Music (showcasing global musical trends)
1530	BBC (E,W,S Af)	World Learning (various educational series)
1545	BBC (ME)	Sports Roundup
1545	BBC (S As)	World Business Report

1500	BBC (All)	News
1500	BBC (ME/S As)	World Briefing
1505	BBC (Eu/N Af)	One Planet (development and the environment)
1505	BBC (Am)	Focus on Football (global soccer) [1st wk.]
1505	BBC (As)	Sports International (anthologies) [exc. 1st wk.]
1505	BBC (E As/Pa/Au)	Meridian-Masterpiece (best performances)
1505	BBC (E,W,S Af)	Focus on Africa (regional correspondents' reports)
1530	BBC (Eu/N Af)	People and Places (global views/experiences)
1530	BBC (ME/S As)	British News
1530	BBC (Am)	Pick of the World (World Service highlights)
1530	BBC (E As/Pa/Au)	Westway (drama series)
1530	BBC (E,W,S Af)	World Learning (various educational series)
1545	BBC (E As/Pa/Au)	Music X-Press (trend-setting popular music)
1545	BBC (ME)	Sports Roundup
1545	BBC (S As)	World Business Report

1500	BBC (All)	News
1505	BBC (All)	Sportsworld (play-by-play/reports)[continues from 1405]



FREQUENCIES

[illegible]

SELECTED PROGRAMS

Sundays

1600	BBC (Am/ Eu/N Af/ S As)	News
1600	BBC (E As/Pa/Au/E Af/ Me/ W&S Af)	World Briefing
1601	BBC (Am/ Eu/N Af)	Concert Hall (classical music)
1620	BBC (most)	British News
1630	BBC (E As/Pa/Au/E Af/ Me)	World Learning (educational series)
1630	BBC (S As)	Sports Roundup
1630	BBC (W&S Af)	World Learning (educational series)
1645	BBC (E As/Pa/Au/Me/W&S Af)	Sports Roundup

Mondays

1600	BBC (Am/ E As/Pa/Au/ Eu/N Af)	World Briefing
1600	BBC (E Af/ S As/ W&S Af/ Me)	News
1605	BBC (Me)	Outlook (topical magazine)
1605	BBC (E Af/ W&S Af)	Meridian-Ideas (cultural trends)
1605	BBC (S As)	Health Matters (medical news)
1620	BBC (most)	British News
1630	BBC (Am/Eu/N Af/E As/Pa/Au)	Analysis (of a current event/issue)
1630	BBC (E Af/ W&S Af)	Fast Track (African sport)
1630	BBC (S As)	Everywoman (in'l women's mag)
1645	BBC (Am Eu/N Af/ E As/Pa/Au)	Sports Roundup
1645	BBC (Me)	Patterns of Faith (moral/spiritual reflections)

Tuesdays

1600	BBC (E As/Pa/Au/Eu/N Af)	World Briefing
1600	BBC (E Af/SAs/ W&S Af/Me)	News
1605	BBC (Me)	Outlook (topical magazine)
1605	BBC (E Af/W&S Af)	Meridian-Screen (inf'l film/cinema)
1605	BBC (S As)	Science View (astronomy/discoveries/computing/trends)

1620 BBC (Am Eu/N Af/ E As/Pa/Au)
1630 BBC (Am)
1630 BBC (Eu/N Af/ E As/Pa/Au)
1630 BBC (E Af/ W&S Af)
1630 BBC (S As)
1645 BBC (Am Eu/N Af/ E As/Pa/Au)
1645 BBC (Me)

Wednesdays

1600 BBC (E As/Pa/Au/ Eu/N Af)
1600 BBC (E Af S As/W&S Af/Me)
1605 BBC (Me)
1605 BBC (W&S Af/E Af)
1605 BBC (S As)

1620 BBC (most)
1630 BBC (Am/ Eu/N Af/ E As/Pa/Au)
1630 BBC (E Af/W&S Af)
1630 BBC (S As)
1645 BBC (Am/ Eu/N Af/ E As/Pa/Au)
1645 BBC (Me)

Thursdays

1600 BBC (E As/Pa/Au/ Eu/N Af)
1600 BBC (E Af S As/W&S Af /Me)
1605 BBC (Me)
1605 BBC (E Af/ W&S Af)
1605 BBC (S As)
1620 BBC (Am/ Eu/N Af/ E As/Pa/Au)
1630 BBC (Am/ Eu/N Af/ E As/Pa/Au)
1630 BBC (E Af /W&S Af)

British News
Analysis (of a current event/issue)
Analysis (of a current event/issue)
African Perspective (opinion/comment)
Focus on Faith (religious issues)
Sports Roundup
Plain English (on language)

World Briefing
News
Outlook (topical magazine)
Meridian-Music (classical music trends)
Focus on Football (global soccer) [1st
wk.]Sports Int'l (anthologies)[exc. 1st
wk.]
British News
From Our Own Correspondent
Talkabout Africa (African events/issues)
Pick of the World (World Service)
Sports Roundup
Heart and Soul (faith/religion)

- World Briefing
- News
- Outlook (topical magazine)
- Meridian-Writing (literature)
- One Planet (development/environment)
- British News
- Analysis (of a current event/issue)
- Art Beat (the arts in Af)

1630 BBC (S As)
1645 BBC (Am/ Eu/N Af/ E As/Pa/Au)
1645 BBC (Me)

Fridays

1600 BBC (E As/Pa/Au/ Eu/N Af)
1600 BBC (E Af S As/W&S Af/Me)
1605 BBC (Me)
1605 BBC (E Af/ W&S Af)

1605 BBC (S As)
1620 BBC (Am)
1620 BBC (Am/ Eu/N Af/ E As/Pa/Au)
1630 BBC (Am/ Eu/N Af/ E As/Pn/Au)

1630 BBC (Eu/N Af)
1630 BBC (E Af/ W&S Af)
1630 BBC (S As)

1645 BBC (Am/ Eu/N Af/ E As/Pa/Au)
1645 BBC (Me)

Saturdays

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1600 BBC (all)
1605 BBC (Me)
1605 BBC (most)
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People and Places (forum for global views/experiences)
Sports Roundup
Best of "The Edge" (youth magazine)

- World Briefing
- News
- Outlook (topical magazine)
- Meridian-Masterpiece (showcasing best performances)
- Discovery (scientific ideas/trends/research)
- British News
- British News
- Analysis (of a current event/issue)
- The New Europe (integration efforts)[last wk.]
- Fast Track (African sport)
- Essential Guide (backgrounding aspects)
- Sports Roundup
- Body and Mind (health/medicine)

News
Outlook (topical magazine)
Sportsworld (play-by-play/
reports)[continues from 1405]



FREQUENCIES

1700	1800		Anguilla, Caribbean Beacon	11775am					1800	1900		Anguilla, Caribbean Beacon	11775am				
1700	1800	vl	Australia, ABC/Alice Springs	2310do					1800	1900		Argentina, RAE	15345eu				
1700	1800	vl	Australia, ABC/Katherine	2485do					1800	1900	mtwhf	Australia, ABC/Alice Springs	2310do				
1700	1800	vl	Australia, ABC/Tennant Creek	2225do					1800	1900	vl	Australia, ABC/Katherine	2485do				
1700	1800		Australia, Radio	9815pa 11880va	6080va	9475as	9580va		1800	1900	vl	Australia, ABC/Tennant Creek	2325do				
1700	1800	vl	Botswana, Radio	3356do	4820do	7255do			1800	1900		Australia, Radio	6080pa 11880va	7240pa	9475as	9580va	
1700	1800	vl	Cameron, RTV/Yaounde	4850do					1800	1830		Azerbaijan, Voice of	6110eu				
1700	1800	vl	Canada, CBC Northern Service	9625do					1800	1900		Bangladesh, Bangla Betar	7184eu	7462eu	9550eu	15520eu	
1700	1800	a	Canada, CFRX Toronto ON	6070do					1800	1900	vl	Botswana, Radio	3356do	4820do			
1700	1800		Canada, CFVP Calgary AB	6030do					1800	1900	vl	Cameroun, RTV/Yaounde	4850do				
1700	1800		Canada, CKZN St John's NF	6160do					1800	1900		Canada, CFRX Toronto ON	6070do				
1700	1800		Canada, CKZU Vancouver BC	6160do					1800	1900		Canada, CFVP Calgary AB	6030do				
1700	1756		China China Radio International	5220af 11910af	9570af	9670af	9695af		1800	1900		Canada, CKZN St John's NF	6160do				
1700	1800		Costa Rica, R for Peace Intl	15050va	21815va				1800	1900		Canada, CKZU Vancouver BC	6160do				
1700	1800		Costa Rica, University Network	5030am 11870va	6150va	7375na	9725na		1800	1900		Costa Rica, R for Peace Intl	15050va	21815va			
1700	1727		Czech Rep, Radio Prague Intl	5930oe	17485af				1800	1900		Costa Rica, University Network	5030am 11870va	6150va	7375na	9725na	
1700	1800		Egypt, Radio Cairo	15255af					1800	1827		Czech Rep, Radio Prague Intl	5930oe	7315va			
1700	1800	mtwhf	Eqt Guinea, Radio Africa	15185af					1800	1830		Egypt, Radio Cairo	15255af				
1700	1800	a/monthly	Finland, Scandv Weekend Radio	11720va					1800	1900	mtwhf	Eqt Guinea, Radio Africa	15185af				
1700	1730		France, R France International	15210af	17605af				1800	1900	a/monthly	Finland, Scandv Weekend Radio	11720va				
1700	1800		Germany, Deutsche Welle	6140oe					1800	1830		Georgia, Georgian Radio	11910eu				
1700	1800	a	Germany, Good News World R	11795me					1800	1900		Germany, Deutsche Welle	6140oe				
1700	1800		Germany, Overcomer Ministries	13810me					1800	1900		Germnay, Voice of Hope	9495me				
1700	1800	vl	Ghana, Ghana BC Corp	3366do	4915do				1800	1900	vl	Ghana, Ghana BC Corp	3366do	4915do			
1700	1800		Guyana, Voice of	5949do					1800	1900		Guyana, Voice of	5949do				
1700	1800	irreg	Iraq, Radio Iraq International	7070va					1800	1900		India, All India Radio	7410oe	9950eu	11620eu	11935af	
1700	1800		Israel, Kol Israel	11605va	13740va				1800	1900		Italy, IRRS	15200af	17670af			
1700	1800		Japan, Radio	9505na	12000eu	15355af			1800	1830		Kenya, Kenya BC Corp	4935do				
1700	1730		Jordan, Radio	11690eu					1800	1900	vl	Kuwait, Radio	11990va				
1700	1800		Kenya, Kenya BC Corp	4935do					1800	1900		Lesotho, Radio	4800do				
1700	1800	vl	Lesotho, Radio	4800do					1800	1900		Liberia, ELWA	4760do				
1700	1800	vl	Liberia, ELWA	4760do					1800	1900	vl	Liberia, R Liberia International	5100do				
1700	1800	vl	Liberia, R Liberia International	6100do					1800	1900	vl	Liberia, Voice of Hope	11530af				
1700	1800	vl	Liberia, Voice of Hope	11530af					1800	1900		Malawi, Malawi BC Corp	3380do				
1700	1800	vl	Malawi, Malawi BC Corp	3380do					1800	1900	vl	Malawi, Malawi BC Corp	3380do				
1700	1800		Malaysia, Radio	7295do					1800	1900		Malaysia, Radio	7295do				
1700	1800	mtwhf	Namibia, Namibian BC Corp	3270af	3289af				1800	1900		Namibia, Namibian BC Corp	3270af	3289af			
1700	1800		New Zealand, R New Zealand Int	15120pa					1800	1900		Netherlands, Radio	6020af	11655af			
1700	1800		New Zealand, ZLX	3935do					1800	1900		New Zealand, R New Zealand Int	15120pa				
1700	1800	vl	Nigeria, Radio/Enugu	6025do					1800	1850	mtwhf	New Zealand, ZLX	3935do				
1700	1800	vl	Nigeria, Radio/Ibadan	6050do					1800	1900		Nigeria, Radio/Enugu	6025do				
1700	1800	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do		1800	1900	vl	Nigeria, Radio/Ibadan	6050do				
1700	1800		Nigeria, Radio/Lagos	3326do	4990do				1800	1900	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do	
1700	1800		Palau, KHBN/Voice of Hope	9965as	9965as	13840as			1800	1900	vl	Nigeria, Radio/Lagos	3326do	4990do			
1700	1756		Romania, R Romania International	15250eu	15390eu	17720eu	17735eu		1800	1900	vl	Palau, KHBN/Voice of Hope	9965as	13840as			
1700	1800		Russia, Voice of Russia WS	17805eu 12055me	9730eu	9875as	12015me	12025as	1800	1900		Philippines, Radio Filipinas	11720me	15190me	17720me		
1700	1730		S Africa, Channel Africa	17860af					1800	1855		Poland, Radio Polonia	6000oe	7285eu			
1700	1800		S Africa, World Beacon	6145af					1800	1900	sm wh a	Russia, Voice of Russia WS	9820eu				
1700	1800		Sierra Leone, Sierra Leone BS	5980do					1800	1900		Russia, Voice of Russia WS	9480oe	9775eu	9890eu	11510af	
1700	1715		Somalia, Radio Galkayo	6985va					1800	1900		S Africa, Adventist World Radio	5960af	12015af			
1700	1800	irreg	Sri Lanka, Sri Lanka BC Corp	4940do					1800	1830	m	S Africa, Amateur Radio League	3215af				
1700	1800	vl	Sudan, Radio Omdurman	7199do	9200do	9505do			1800	1900		S Africa, Channel Africa	17870af				
1700	1800		Uganda, Radio	4976do	5026do				1800	1830		S Africa, World Beacon	3230af	11640af			
1700	1800		UK, BBC World Service	3255af	3915af	5975as	6005af		1800	1900		Sierra Leone, Sierra Leone BS	5980do				
				6190af	7160as	9510as	9630af		1800	1900	irreg	Sri Lanka, Sri Lanka BC Corp	4940do				
				12095eu	15400af	15420af	15485eu	15575me	1800	1900		Swaziland, Trans World Radio	3200af				
				17830af	17840na				1800	1900		Taiwan, R Taiwan International	3955eu				
1700	1730	a	UK, Flat Earth Radio/Merlin	15525eu	15665na	21515af			1800	1900		Uganda, Radio	4976do	5026do			
1700	1730	mtwhf	UK, Merlin Network One	12065as					1800	1900		UK, BBC World Service	3255af	5975as	6190af	9410eu	
1700	1800		UK, World Beacon	15455eu					1800	1830		USA, Armed Forces Radio	9740pa	12095eu	15400af	15420af	
1700	1800		USA, Armed Forces Radio	4278va	4319va	4993va	5765va		1800	1900		USA, KAIJ Dallas TX	17840na				
				6350va	6458va	6847va	10320va	10940va	1800	1900	a	UK, Merlin Network One	6130af	12065as			
				12579va	12689va	13362va	16847va		1800	1900	mtwhf	UK, RTE Radio	15315me				
1700	1800		USA, KAIJ Dallas TX	13815va					1800	1830		UK, World Beacon	15585af	17665af			
1700	1800		USA, KTBN Salt Lake City UT	15590na					1800	1900		USA, Armed Forces Radio	4278va	4319va	4993va	5765va	
1700	1800		USA, KWHR Naalehu HI	9930as	7125as	7170as	9645as		1800	1900		USA, KAIJ Dallas TX	13815va	15410af	9760af	9770me	
1700	1800		USA, Voice of America	6160as 9700me 17895af	7125as 15255va 9760af	7170as 15410af 15445af	9645as 15445af		1800	1900		USA, KTBN Salt Lake City UT	15590na	15410af	17895af		
1700	1800	mtwhf	USA, Voice of America	5990as	6045as	7215as	9550as		1800	1900		USA, KWHR Naalehu HI	9930as	7415af	9760af	9770me	
1700	1800		USA, WEWN Birmingham AL	11875na	13615na	15375na	15745na		1800	1900		USA, Voice of America	6035af	15410af	15580af		
1700	1800		USA, WGTG McCaysville GA	9400am	12170am				1800	1900		USA, WEWN Birmingham AL	11875na	13615na	15375na	15745na	
1700	1800		USA, WHRA Greenbush ME	17650af					1800	1900		USA, WGTG McCaysville GA	9400am	12170am			
1700	1800		USA, WHRI Noblesville IN	13760sa	15105na				1800	1900		USA, WHRA Greenbush ME	17650af				
1700	1800		USA, WINB Red Lion PA	13570eu					1800	1900		USA, WHRI Noblesville IN	9495sa	13760na			
1700	1800		USA, WJCR Upton KY	7490va	13595as				1800	1900		USA, WINB Red Lion PA	13570eu				
1700	1800		USA, WMLK Bethel PA	15265eu					1800	1900		USA, WJCR Upton KY	7490va	13595as			
1700	1800		USA, WRMI Miami FL	15725am					1800	1900		USA, WMLK Bethel PA	15265eu				
1700	1800		USA, WSHB Cypress Crk SC	18910af					1800	1900		USA, WRMI Miami FL	15725am				
1700	1800		USA, WTJC Newport NC	9370na					1800	1900		USA, WSHB Cypress Crk SC	15665eu	18910af			
1700	1800		USA, WWCR Nashville TN	9475am	12160am	13845am	15685am		1800	1900		USA, WTJC Newport NC	9370na				
1700	1800		USA, WYFR Okeechobee FL	18980eu	21455eu				1800	1900		USA, WWCR Nashville TN	9475am	12160am	13845as	15685am	
1700	1727		Vietnam, Voice of	12070oe					1800	1900		USA, WYFR Okeechobee FL	17555eu				
1700	1800		Zambia, Christian Voice	4965do					1800	1827		Vietnam, Voice of	7440oe	9730oe	13740eu		
1700	1800	vl	Zambia, National BC Corp	6165do	6265do				1800	1900		Yemen, Rep of Yemen Radio	9779me				
1700	1800	vl	Zimbabwe, Zimbabwe BC Corp	4828do	6045do				1800	1900	vl	Zambia, Christian Voice	4965do	6265do			
1715	1730		Albania, R Tirana International	9510oe					1800	1900	s	Zambia, National BC Corp	6165do	6045do			
1715	1730		Vatican City, Vatican Radio	4005eu	5880eu	7250eu	9645eu		1810	1900		Zimbabwe, Zimbabwe BC Corp	4828do	6045do			
				15595eu					1830	1900		Greece, Voice of	9420oe	15630af	17705na		
1725	1740		Monaco, Trans World Radio	6145me					1830	1900		Ascension Is, RTE Radio	21630af				
1730	1800	vl	Guam, Adventist World Radio	11560va	11965va	11965as			1830	1900		Austria, R Austria International	17330af				
1730	1745		Libya, Voice of Africa	11815af	17725af				1830	1900	vl	Belgium, Radio Vlaanderen Intl	5910oe	9925eu	13710eu		
1730	1800		Netherlands, Radio	6020af	11655af				1830	1900		Canada, RTE Radio	13725na				
1730	1800		Philippines, Radio Filipinas	11720me	15190me	17720me											



FREQUENCIES

1900	2000		Anguilla, Caribbean Beacon	11775am					2000	2100		Algeria, R Algiers International	11715eu	15160eu			
1900	2000	vi	Australia, ABC/Katherine	2485do					2000	2100		Angola, R Nacional de Angola	3374va	7245va			
1900	2000		Australia, ABC/Tennant Creek	2325do					2000	2100		Anguilla, Caribbean Beacon	11775am				
1900	2000		Australia, Radio	6080pa	7240pa	9500as	9580va		2000	2100	vi	Australia, ABC/Alice Springs	2325do				
			9815pa	11880va					2000	2100	vi	Australia, ABC/Katherine	2485do				
1900	2000	vi	Botswana, Radio	3356do	4820do				2000	2100	vi	Australia, ABC/Tennant Creek	2325do	9500as	9580va	9815pa	11880va
1900	2000	vi	Cameroon, RTV/Yaounde	4850do					2000	2100		Australia, Radio	9500as				
1900	2000		Canada, CFRX Toronto ON	6070do					2000	2100	vi	Botswana, Radio	3356do	4820do			
1900	2000		Canada, CFVP Calgary AB	6030do					2000	2100	vi	Bulgaria, Radio	7200eu	7500eu			
1900	2000		Canada, CKZN St John's NF	6160do					2000	2100	vi	Cameroon, RTV/Yaounde	4850do				
1900	2000		Canada, CKZU Vancouver BC	6160do					2000	2100		Canada, CFRX Toronto ON	6070do				
1900	1956		China China Radio International	9440af	11750af	13790af			2000	2100		Canada, CFVP Calgary AB	6030do				
1900	1915		Congo, RTV Congolaise	5985do					2000	2100		Canada, CKZN St John's NF	6160do				
1900	2000		Costa Rica, R for Peace Intl	15050va	21815va				2000	2100		Canada, CKZU Vancouver BC	6160do				
1900	2000		Costa Rica, University Network	5030am	6150va	7375na	9725na		2000	2100		Canada, R Canada International	5995va	11690va	13650va	13670va	
			11870va	13749af								15325va	15470va	17820va	17870va		
1900	2000		Ecuador, HCJB	17660eu					2000	2059		China China Radio International	7335eu	7390eu	9440af	11735af	
1900	2000	mtwhf	Eat Guinea, Radio Africa	15185af					2000	2100		Costa Rica, R for Peace Intl	15050va	21815va			
1900	2000	a/monthly	Finland, Scandv Weekend Radio	11720va					2000	2100		Costa Rica, University Network	5030am	6150va	7375na	9725na	
1900	1945		Germany, Deutsche Welle	11765af	11810af	13610af	15135af					11870va	13749af				
			15390af	17810af					2000	2100		Ecuador, HCJB	17660eu				
1900	2000		Germany, Voice of Hope	7290me					2000	2100	mtwhf	Eat Guinea, Radio Africa	15185af				
1900	2000	vi	Ghana, Ghana BC Corp	3366do	4915do				2000	2100	a/monthly	Finland, Scandv Weekend Radio	11720va				
1900	1945		India, All India Radio	7410eu	9950eu	11620eu	11935af		2000	2045		Germany, Deutsche Welle	9725eu				
			13750af	15200af	17670af				2000	2100	vi	Germany, Voice of Hope	7290me				
1900	2000	vi	Italy, IRRS	3985va					2000	2100		Ghana, Ghana BC Corp	3366do	4915do			
1900	2000		Kenya, Kenya BC Corp	4935do					2000	2030		Hungary, Radio Budapest	6025eu	7135eu			
1900	2000		Kuwait, Radio	11990va					2000	2027		Indonesia, Voice of	9525va	11785va	15149va		
1900	2000	vi	Lesotho, Radio	4800do					2000	2030		Iran, VOIR	6110eu	7215eu	9022eu		
1900	2000	vi	Liberia, ELWA	4760do								Israel, Kol Israel	6220va	7410va	7510va	9435va	
1900	2000	vi	Liberia, R Liberia International	5100do					2000	2100	vi	Italy, IRRS	11605va				
1900	2000		Liberia, Voice of Hope	11530af					2000	2100		Kenya, Kenya BC Corp	4935do				
1900	2000	vi	Malawi, Malawi BC Corp	3380do					2000	2100		Kuwait, Radio	11990va				
1900	2000		Malaysia, Radio	7295do					2000	2100	vi	Lesotho, Radio	4800do				
1900	2000		Namibia, Namibian BC Corp	3270af	3289af				2000	2100	vi	Liberia, ELWA	4760do				
1900	2000		Netherlands, Radio	6020af	11655af	13700af	17605af		2000	2100	vi	Liberia, R Liberia International	5100do				
1900	2000		New Zealand, R New Zealand Int	17675pa					2000	2100	vi	Malawi, Malawi BC Corp	3380do				
1900	2000		New Zealand, ZLXA	3935do					2000	2100		Malaysia, Radio	7295do				
1900	2000	vi	Nigeria, Radio/Enugu	6025do					2000	2100	mtwhfa	Malta, Voice of Mediterranean	7440eu				
1900	2000	vi	Nigeria, Radio/Ibadan	6050do					2000	2030		Mongolia, Voice of	12015eu	12085eu			
1900	2000	vi	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do		2000	2100		Namibia, Namibian BC Corp	3270af	3289af			
1900	2000	vi	Nigeria, Radio/Lagos	3326do	4990do				2000	2025		Netherlands, Radio	6020af	11655af	13700af	17605af	
1900	2000	vi	Nigeria, Voice of	7255af	15120af				2000	2100		New Zealand, R New Zealand Int	17675pa				
1900	2000		North Korea, R Pyongyang	4405va	6574na	9335na	11710na		2000	2100	vi	New Zealand, ZLXA	3935do	7290do			
			13760na						2000	2100	vi	Nigeria, Radio/Enugu	6025do				
1900	1930		Philippines, Radio Filipinas	11720me	15190me	17720pa			2000	2100	vi	Nigeria, Radio/Ibadan	6050do				
1900	2000		Russia, Voice of Russia WS	7300eu	9480eu	9720eu	9775eu		2000	2100	vi	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do	
			9820eu	9890eu	11510af	11675eu	11695af		2000	2100	vi	Nigeria, Radio/Lagos	3326do	4990do			
			12015af						2000	2100	vi	Nigeria, Voice of	7255af	15120af			
1900	2000		Russia, World Beacon	7360eu					2000	2100		Papua New Guinea, NBC	4890do				
1900	2000		S Africa, World Beacon	3230af					2000	2100		Russia, Voice of Russia WS	9480eu	9775eu	9820eu	9890eu	
1900	2000	vi	Sierra Leone, Sierra Leone BS	3316do	11640af				2000	2100		11675eu	12070eu				
1900	2000		Solomon Islands, SIBC	5020do					2000	2100	vi	Russia, World Beacon	7360eu	11640af			
1900	2000		South Korea, R Korea Intl	5975om	7275eu				2000	2100	vi	S Africa, World Beacon	3230af				
1900	2000	irreg	Sri Lanka, Sri Lanka BC Corp	4940do					2000	2100	mtwhf	Sierra Leone, Sierra Leone BS	3316do				
1900	2000	a	Sri Lanka, Sri Lanka BC Corp	6010eu					2000	2100	irreg	Solomon Islands, SIBC	5020do	15285af			
1900	2000		Swaziland, Trans World Radio	3200af					2000	2015		Spain, R Exterior Espana	5955af				
1900	2000		Thailand, Radio	7195eu	9655eu	11905eu			2000	2030		Sri Lanka, Sri Lanka BC Corp	4940do				
1900	2000		Uganda, Radio	4976do	5026do				2000	2100	vi	Swaziland, Trans World Radio	3200af	9605af	11910af	13660af	
1900	2000		UK, BBC World Service	3255af	6005af	6190af	6190eu		2000	2030		Switzerland, Swiss R International	6165af				
			9410eu	9630af	9740pa	12095eu	15400af		2000	2100	vi	Syria, Radio Damascus	12085eu	13610eu			
			15575me	17830af					2000	2100		Turkey, Voice of	6140as	7125as			
1900	2000	a	UK, BBC World Service	17840na					2000	2100		Uganda, Radio	4976do	5026do			
1900	2000	hf	UK, Merlin Network One	6130af					2000	2100		UK, BBC World Service	3255af	5975pa	6005af	6190af	
1900	2000		UK, World Beacon	9675eu	15585eu				2000	2100			6195eu	9410eu	9630af	9740pa	
1900	2000		USA, Armed Forces Radio	4278va	4319va	4993va	5765va		2000	2100			11935eu	12095eu	15400af	17830af	
			6350va	6458va	6847va	10320va	10940va					UK, World Beacon	9675af				
			12579va	12689va	13362va	16847va			2000	2100		USA, Armed Forces Radio	4278va	4319va	4993va	5765va	
1900	2000		USA, KAIJ Dallas TX	13815va					2000	2100			6458va	6847va	10320va	13362va	
1900	2000		USA, KJES Vado NM	15385na					2000	2100		USA, KAIJ Dallas TX	13815va				
1900	2000		USA, KTVN Salt Lake City UT	15590na					2000	2100	vi	USA, KJES Vado NM	15385na				
1900	2000		USA, KWHR Naalehu HI	9930as					2000	2100	mtwhf	USA, KTVN Salt Lake City UT	15590na				
1900	2000		USA, VOA Special English	6160me	9680me	13690me			2000	2030	irreg	USA, KWHR Naalehu HI	9930as				
1900	1930		USA, Voice of America	7260me	9525pa	9760af	9770af		2000	2100		USA, Voice of America	4950af	6035af	6095me	7375af	
			11870pa	15180pa					2000	2100			7415af	9760af	9770af	11855af	
1900	1930	as	USA, Voice of America	6035af	7375af	7415af	11975af		2000	2100			11975af	15410af	15445af	15580af	
1900	2000	a	USA, Voice of America	15445af	15580af				2000	2100		USA, WEWN Birmingham AL	11875na	13615na	15375na	15745na	
1900	2000		USA, Voice of America	4950af					2000	2100		USA, WGTG McCaysville GA	9400am	12170am			
			11970as	12015as	13725me	15235as			2000	2100		USA, WHRA Greenbush ME	17650af				
1900	2000		USA, WEWN Birmingham AL	11875na	13615na	15375na	15745na		2000	2100		USA, WHRI Noblesville IN	5745sa	9495sa	13760na		
1900	2000		USA, WGTG McCaysville GA	9400am	12170am				2000	2100		USA, WINB Red Lion PA	13570eu				
1900	2000		USA, WHRA Greenbush ME	17650af					2000	2100		USA, WJCR Upton KY	7490va	13595as			
1900	2000		USA, WHRI Noblesville IN	5745sa	13760na				2000	2100		USA, WMLK Bethel PA	15265eu				
1900	2000		USA, WINB Red Lion PA	13570eu					2000	2100		USA, WRMI Miami FL	15725am				
1900	2000		USA, WJCR Upton KY	7490va	13595as				2000	2100		USA, WWSB Cypress Crk SC	11550eu	15665af			
1900	2000		USA, WMLK Bethel PA	15265eu					2000	2100	vi	USA, WTJC Newport NC	9370na				
1900	2000		USA, WRMI Miami FL	15725am					2000	2100		USA, WWCR Nashville TN	9475am	12160am	13845am	15685am	
1900	2000		USA, WWSB Cypress Crk SC	115665eu	18910af				2000	2100		USA, WYFR Okeechobee FL	17555eu	17845af			
1900	2000		USA, WTJC Newport NC	9370na					2000	2100	vi	Vanuatu, Radio	3945do	4960do	7260do		
1900	2000		USA, WWCR Nashville TN	9475am	12160am	13845am	15685am		2000	2100		Vatican City, Vatican Radio	9660af	11625af	13765af		
1900	2000		USA, WYFR Okeechobee FL	17555eu					2000	2100		Zambia, Christian Voice	4965do				
1900	1927		Vietnam, Voice of	9730eu	13740eu				2000	2100	vi	Zambia, National BC Corp	6165do	6265do			
1900	2000	vi	Zambia, Christian Voice	4965do					2000	2100		Zimbabwe, Zimbabwe BC Corp	4828do	60			



FREQUENCIES

2100	2200		Anguilla, Caribbean Beacon	11775am			
2100	2115	mtwhfa	Armenia, Voice of	4810eu	9965eu		
2100	2130		Australia, ABC/Alice Springs	2310do			
2100	2130	vi	Australia, ABC/Katherine	2485do			
2100	2130	vi	Australia, ABC/Tennant Creek	2325do			
2100	2130		Australia, Radio	7240pa 12080va	9500as 17715pa	9580va 21740va	9660pa
2100	2200	vi	Botswana, Radio	3356do	4820do		
2100	2200		Cameron, RTV/Yaounde	4850do			
2100	2200	vi	Canada, CBC Northern Service	9625do			
2100	2200		Canada, CFRX Toronto ON	6070do			
2100	2200		Canada, CFVP Calgary AB	6030do			
2100	2200		Canada, CKZN St John's NF	6160do			
2100	2200		Canada, CKZU Vancouver BC	6160do			
2100	2200		Canada, R Canada International	7235va 15325va 17820va	11690va 17870va	13650va	13670va
2100	2159		China China Radio International	7335eu 11790eu	7390eu 17790eu	9440af	11735af
2100	2200		Costa Rica, R for Peace Intl	15050va	21815va		
2100	2200		Costa Rica, University Network	5030am 11870va	6150va 13749af	7375na	9725na
2100	2130		Cuba, Radio Havana	13660eu	13750eu		
2100	2127		Czech Rep, Radio Prague Intl	5930va	9430va		
2100	2200		Ecuador, HCJB	17660eu			
2100	2200		Egypt, Radio Cairo	15375af			
2100	2200	mtwhf	Eq Guinea, Radio Africa	15185af			
2100	2200	f/monthly	Finland, Scandv Weekend Radio	11690va			
2100	2145		Germany, Deutsche Welle	9615af 15410va	9690af 17835af	9765va	15135va
2100	2200	vi	Ghana, Ghana BC Corp	3366do	4915do		
2100	2200		India, All India Radio	7150va	7410eu	9650eu	9910au
2100	2200			9950eu	11620eu 11715me		
2100	2200	irreg	Iraq, Radio Iraq International	9684va	11787me		
2100	2200	vi	Italy, IRRS	3985va			
2100	2200		Japan, Radio	6035pa 17825na	9725eu	11850pa	11855af
2100	2110		Kenya, Kenya BC Corp	21670pa 4935do			
2100	2200	vi	Lesotho, Radio	4800do			
2100	2200	vi	Liberia, ELWA	4760do			
2100	2200	vi	Liberia, R Liberia International	5100do			
2100	2200	vi	Malawi, Malawi BC Corp	3380do			
2100	2200		Malaysia, Radio	7295do			
2100	2200		Namibia, Namibian BC Corp	3270af	3289af		
2100	2200		New Zealand, R New Zealand Int	17675pa			
2100	2200		New Zealand, ZLXA	3935do			
2100	2200	vi	Nigeria, Radio/Enugu	6025do			
2100	2200	vi	Nigeria, Radio/Ibadan	6050do			
2100	2200	vi	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
2100	2200	vi	Nigeria, Radio/Lagos	3326do	4990do		
2100	2156		North Korea, R Pyongyang	6574va	9335va		
2100	2200	vi	Palau, KHBV/N Voice of Hope	9985as 4890do			
2100	2200		Papua New Guinea, NBC	6035eu	7185eu	7265eu	9525eu
2100	2105		Poland, Radio Polonia	11740eu	11940eu	15105eu	15180eu
2100	2156		Romania, R Romania International	9775eu	9775eu	9820eu	9890eu
2100	2200		Russia, Voice of Russia WS	11675eu 15485eu			
2100	2200		Russia, World Beacon	7360eu			
2100	2200		S Africa, World Beacon	3230af	11640af		
2100	2200		Sierra Leone, Sierra Leone BS	3316do			
2100	2200	vi	Solomon Islands, SIBC	5020do	9545do		
2100	2130		South Korea, R Korea Intl	3970eu	6480eu		
2100	2200		South Korea, R Korea Intl	15575eu			
2100	2200	s	Spain, R Exterior Espana	9595af	9840eu		
2100	2200	irreg	Sri Lanka, Sri Lanka BC Corp	4940do			
2100	2200	vi	Syria, Radio Damascus	12085eu	13610eu		
2100	2115	mtwhf	UK, BBC World Service	11765ca			
2100	2200		UK, BBC World Service	6005af 11835af	3255af 11945as	3915as 12095sa	5965as 15400af
2100	2200		UK, World Beacon	9675af			
2100	2200		USA, Armed Forces Radio	4278va 6350va 12579va	4319va 6458va 12689va	4993va 10320va 16847va	5765va 10940va
2100	2200		USA, KAU Dallas TX	13815va			
2100	2200		USA, KTVN Salt Lake City UT	15590na			
2100	2200		USA, KWHR Naelehu HI	17510as			
2100	2130		USA, Voice of America	6035af 7415af 11975af 1725af	6040me 9535af 15185as 17735as	6095me 9760pa 15445af 17820as	7375af 11870pa 15580af
2100	2200		USA, WBCQ Monticello ME	7415na			
2100	2200		USA, WEWN Birmingham AL	9975na	11875na	13615na	15375na
2100	2200		USA, WGTG McCaysville GA	9400am	12170am		
2100	2200		USA, WHRA Greenbush ME	17650af			
2100	2200		USA, WHRI Noblesville IN	5745na	9495sa	13760na	
2100	2200		USA, WINB Red Lion PA	13570eu			
2100	2200		USA, WJCR Upton KY	7490va	13595as		
2100	2200		USA, WMLK Bethel PA	15265eu			
2100	2200		USA, WRMI Miami FL	15725am			
2100	2200		USA, WSHB Cypress Crk SC	11550eu	15665af		
2100	2200		USA, WTJC Newport NC	9370na			
2100	2200		USA, WWCR Nashville TN	7435am	9475am	12160am	13845am
2100	2145		USA, WYFR Okeechobee FL	15120af	17555eu	17845af	
2100	2200	vi	Vanuatu, Radio	3945do	4960do	7260do	
2100	2200		Zambia, Christian Voice	4965do			
2100	2200	vi	Zambia, National BC Corp	6165do	6265do		
2100	2200	vi	Zimbabwe, Zimbabwe BC Corp	4828do	6045do		
2110	2130		Vatican City, Vatican Radio	4005eu	5880eu	7250eu	9645eu
2115	2200		Egypt, Radio Cairo	9990eu			
2115	2130	mtwhf	UK, BBC Caribbean Report	9575ca	11675ca	15390ca	

2115	2130	as	UK, BBC World Service	5975ca			
2120	2200	s	Greece, Voice of	9425au	15650au		
2130	2200	vl	Australia, ABC/Alice Springs	4835do			
2130	2200	vl	Australia, ABC/Katherine	5025do			
2130	2200	vl	Australia, ABC/Tennant Creek	4910do			
2130	2200		Australia, Radio	7240pa	9660pa	11880va	12080va
			17715pa	21740va			
2130	2200		Australia, Radio	7240pa	9660pa	11880va	12080va
			17715pa	21740va			
2130	2200		Austria, R Austria International	5945eu	6155eu	13730af	
2130	2200	th	Belarus, R Belarus International	7105eu	7210as		
2130	2200		Guam, Adventist World Radio	11980as	15550as		
2130	2227		Iran, VOIR	9780as	11740as		
2130	2200		Turkey, Voice of	9525eu			
2130	2145	tf	UK, BBC Calling Falklands	11680sa			
2130	200	f	UK, Wales Radio Int'l/Merlin	6010eu			
2130	2200		USA, Voice of America	6040me	6095me	9535af	9705as
			9760eu	11870pa	15185as	17785as	17820as
2130	2200	smtwhf	USA, Voice of America	6035af	7375af	7415af	11975af
			15410af	15445af	15580af	17785af	
2130	2200		Uzbekistan, Radio Tashkent	9540eu	9545eu		
2145	2200		USA, WYFR Okeechobee FL	15120af	17845af		

2200

2200	2300		Anguilla, Caribbean Beacon	6090am			
2200	2300	vl	Australia, ABC/Alice Springs	4835do			
2200	2300	vl	Australia, ABC/Katherine	5025do			
2200	2300	vl	Australia, ABC/Tennant Creek	4910do			
2200	2300		Australia, Radio	11715pa	17795va	21740va	
2200	2300		Bulgaria, Radio	7200eu	7500eu		
2200	2300	vl	Cameron, RTV/Yaounde	4850do			
2200	2300		Canada, CBC Northern Service	9625do			
2200	2300		Canada, CFRX Toronto ON	6070do			
2200	2300		Canada, CFVP Calgary AB	6030do			
2200	2300		Canada, CKZN St John's NF	6160do			
2200	2300		Canada, CKZU Vancouver BC	6160do			
2200	2230		Canada, R Canada International	5960am	9755am	13670am	15305am
			17695am	17835as			
2200	2256		China China Radio International	7170eu	9880eu		
2200	2300		Costa Rica, R for Peace Intl	15050va	21815va		
2200	2300		Costa Rica, University Network	5030am	6150va	7375na	9725na
			11870va	13749af			
2200	2245		Egypt, Radio Cairo	9990eu			
2200	2300	mtwhf	Eqt Guinea, Radio Africa	15185af			
2200	2300	f/monthly	Finland, Scandv Weekend Radio	11690va			
2200	2300		Germany, Overcomer Ministries	3965eu			
2200	2300	vl	Ghana, Ghana BC Corp	3366do	4915do		
2200	2220	s	Greece, Voice of	9425au	15650ou		
2200	2230		Hungary, Radio Budapest	6025eu			
2200	2230		Hungary, Radio Budapest	6025eu			
2200	2230		India, All India Radio	7150va	7410eu	9650eu	9910ou
			9950eu	11620au	11715me		
2200	2300	vl	Italy, IRRS	3985va			
2200	2225		Italy, RAI International	9675as	11900as	15240as	
2200	2300	vl	Liberia, R Liberia International	5100do			
2200	2210	vl	Malawi, Malawi BC Corp	3380do			
2200	2300		Malaysia, Radio	7295do			
2200	2300		Namibia, Namibian BC Corp	3270af	3289af		
2200	2300		New Zealand, R New Zealand Int	17675pa			
2200	2300		New Zealand, ZLXA	3935do			
2200	2300	vl	Nigeria, Radio/Enugu	6025do			
2200	2300	vl	Nigeria, Radio/Ibadan	6050do			
2200	2300	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
2200	2300	vl	Nigeria, Radio/Lagos	3326do	4990do		
2200	2300		Palau, KHBN/Voice of Hope	9955as	9965as	9985as	
2200	2230	vl	Papua New Guinea, NBC	4890do			
2200	2300		Sierra Leone, Sierra Leone BS	3316do			
2200	2300	vl	Solomon Islands, SIBC	5020do	9545do		
2200	2300	irreg	Sri Lanka, Sri Lanka BC Corp	4940do			
2200	2300		Taiwan, R Taiwan International	11565eu	15600eu		
2200	2230		Turkey, Voice of	9525as			
2200	2300		UK, BBC World Service	5965as	5975na	6175na	6195va
			7110as	9590na	9660as	11835af	11955as
			12080pa	12095sa	15400af		
2200	2300	fa	UK, Global Kitchen/Merlin	3955eu	6170eu	7165eu	
2200	2300		Ukraine, R Ukraine International	5905va	9560va	11770va	
2200	2300		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
			6350va	6458va	6847va	10320va	10940va
			12579va	12689va	13362va	16847va	
2200	2300		USA, KAUJ Dallas TX	13815va			
2200	2300		USA, KTBN Salt Lake City UT	15590na			
2200	2300		USA, KWHR Naelehu HI	17510as			
2200	2230		USA, Voice of America	7215as	9705as	9770as	11760as
			15185as	15290as	15305as	17785as	17820as
2200	2230	mtwhf	USA, Voice of America	6035af	7340af	7375af	7415af
			11975af				
2200	2300		USA, WBCQ Monticello ME	7415na			
2200	2300		USA, WEWN Birmingham AL	9975na	13615na	15375na	
2200	2300		USA, WGTG Mcaysville GA	9400am	12170am		
2200	2300		USA, WHRA Greenbush ME	17650af			
2200	2300		USA, WHRI Noblesville IN	5745na	9495sa	13760na	
2200	2300		USA, WINB Red Lion PA	13570eu			
2200	2300		USA, WJCR Upton KY	7490va	13595as		
2200	2300		USA, WRMI Miami FL	15725am			
2200	2300		USA, WSHB Cypress Crk SC	7510eu	15285sa		
2200	2300		USA, WTJC Newport NC	9370na			
2200	2300		USA, WWCRC Nashville TN	5070am	7435am	9475am	13845am



FREQUENCIES

2200	2245	USA, WYFR Okeechobee FL	11740na	15120af	17845af				
2200	2300	Vanuatu, Radio	3945do	4960do	7260do				
2200	2300	Zambia, Christian Voice	4965do						
2200	2210	Zambia, National BC Corp	6165do	6265do					
2230	2300	Albania, R Tirana International	7130eu	9540eu					
2230	2300	Australia, Christian Voice	13780va	15165va	17645va	21680va			
2230	2300	Belgium, Radio Vlaanderen Intl	13660am						
2230	2300	Canada, R Canada International	5960na	9755na	13670na				
2230	2300	Cuba, Radio Havana	9550am						
2230	2257	Czech Rep, Radio Prague Intl	7345na	9435af					
2230	2300	Hungary, Radio Budapest	3975eu						
2230	2300	Solomon Islands, SIBC	5020do						
2230	2300	Solomon Islands, SIBC	9545do						
2230	2300	Sweden, Radio	6065va	7235va					
2230	2300	UK, BBC World Service	5965as	5975na	6175na	6195va			
		7110as	9590na	9660as	11835af	11955as			
		12080pa	12095sa	15400af					
2245	2300	India, All India Radio	7410as	9705as	9950as	11620as			
		13625as							
2245	2300	USA, WYFR Okeechobee FL	11740na						
2245	2300	Vatican City, Vatican Radio	9600as	11830as					

2300

2300	0000	Anguilla, Caribbean Beacon	6090am						
2300	0000	Australia, ABC/Alice Springs	4835do						
2300	0000	Australia, ABC/Katherine	5025do						
2300	0000	Australia, ABC/Tennant Creek	4910do						
2300	0000	Australia, Christian Voice	13780va	15165va	17645va	21680va			
2300	0000	Australia, Radio	9660pa	12080va	17715pa	17795va			
		21740va							
2300	0000	Cameroon, RTV/Yaounde	4850do						
2300	0000	Canada, CBC Northern Service	9625do						
2300	0000	Canada, CFRX Toronto ON	6070do						
2300	0000	Canada, CFVP Calgary AB	6030do						
2300	0000	Canada, CKZN St John's NF	6160do						
2300	0000	Canada, CKZU Vancouver BC	6160do						
2300	2330	Canada, R Canada International	5960am	9755am	11895an	13670am			
		15305am	17695am						
2300	2356	China, China Radio International	5990na						
2300	0000	Costa Rica, R for Peace Intl	15050va	21815va					
2300	0000	Costa Rica, University Network	5030am	6150va	7375na	9725na			
		11870va	13749af						
2300	2330	Cuba, Radio Havana	9550am						
2300	0000	Egypt, Radio Cairo	9900am						
2300	0000	Finland, Scandv Weekend Radio	11690va						
2300	2345	Germany, Deutsche Welle	9470as	9815as	13690as	17655as			
2300	0000	Ghana, Ghana BC Corp	3366do	4915do					
2300	0000	India, All India Radio	7410as	9705as	9950as	11620as			
		13625as							
2300	2315	Italy, IRRS	3985va						
2300	0000	Liberia, R Liberia International	5100do						
2300	0000	Malaysia, Radio	7295do						
2300	0000	Malaysia, RTM Kota Kinabalu	5980do						
2300	2330	Mexico, R Mexico International	9705am	11770alt					
2300	0000	Namibia, Namibian BC Corp	3270af	3289af					
2300	2359	New Zealand, R New Zealand Int	17675pa						
2300	0000	New Zealand, ZLXA	3935do						
2300	2305	Nigeria, Radio/Enugu	6025do						
2300	2305	Nigeria, Radio/Ibadan	6050do						
2300	2305	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do			
2300	2305	Nigeria, Radio/Lagos	3326do						
2300	0000	Palau, KHBN/Voice of Hope	9965as	9985as					
2300	2359	Romania, R Romania International	9690eu	11775na	11830eu	15105na			
2300	0000	Sierra Leone, Sierra Leone BS	3316do						
2300	0000	Solomon Islands, SIBC	5020do						
2300	0000	Solomon Islands, SIBC	9545do						
2300	0000	Sri Lanka, Sri Lanka BC Corp	4940do						
2300	0000	Turkey, Voice of	6020eu	9655va					
2300	0000	UK, BBC World Service	3915as	5965as	5975na	6035as			
		6175na	6195as	7110as	9590na	11945as			
		11955as	12095sa	15280as					
2300	0000	UK, Global Kitchen/Merlin	3955eu	6170eu	7165eu				
2300	0000	USA, Armed Forces Radio	4278va	4319va	4993va	5765va			
		6350va	6458va	6847va	10320va	10940va			
		12579va	12689va	13362va					
2300	0000	USA, KAIJ Dallas TX	13815va						
2300	0000	USA, KTVN Salt Lake City UT	15590na						
2300	0000	USA, KWHR Naalehu HI	17510as						
2300	2330	USA, VOA Special English	7190as	7200as	9545as	9795as			
		11925as							
2300	0000	USA, Voice of America	7215as	9770as	11760as	15185as			
		15290as	15305as	17735as	17820as				
2300	0000	USA, WBCQ Monticello ME	7415na						
2300	0000	USA, WEWN Birmingham AL	7425na	9385na	9975na	13615na			
2300	0000	USA, WGTG McCoysville GA	5085am	6890am	9320am				
2300	0000	USA, WHRA Greenbush ME	17650na						
2300	0000	USA, WHRI Noblesville IN	5745na	9495sa	13760na				
2300	0000	USA, WINB Red Lion PA	13570am						
2300	0000	USA, WJCR Upton KY	7490va	13595as					
2300	0000	USA, WRMI Miami FL	9955am						
2300	0000	USA, WSHB Cypress Crk SC	7510va	15285sa					
2300	0000	USA, WTJC Newport NC	9370na						
2300	0000	USA, WWCN Nashville TN	3215am	5070am	7435am	13845am			
2300	2345	USA, WYFR Okeechobee FL	11740na						
2300	0000	Vanuatu, Radio	3945do	4960do	7260do				
2300	2315	Vatican City, Vatican Radio	9600as	11830as					
2300	0000	Zambia, Christian Voice	4965do						
2330	0000	Canada, R Canada International	11895am	15305am	17695am				
2330	2359	Canada, R Canada International	5960am	9755am	13670am				
2330	2357	Czech Rep, Radio Prague Intl	7345na	9435na					
2330	2345	Libya, Voice of Africa	11815af	17725af					
2330	0000	Malaysia, RTM Sarawak	7160do						
2330	0000	Netherlands, Radio	6165na	9845na					
2330	0000	Switzerland, Swiss R International	9885sa	11660sa					
2330	0000	USA, VOA Special English	6060as	7190as	7200as	7225as			
		7260as	9545as	9795as	11805as	11925as			
		13735as	15205as						
2330	2357	Vietnam, Voice of	9840as	12019as					

SELECTED PROGRAMS

Sundays

2300	BBC (Am)	The World Today (international news/analysis)
2300	BBC (Eu/N Af)	The World Today (international news/analysis)
2300	BBC (E As/Pa/Au)	The World Today (international news/analysis)
2330	BBC (Am)	Greenfield Collection (classical music requests)
2330	BBC (Eu/N Af)	Greenfield Collection (classical music requests)

Mondays

2300	BBC (Am)	The World Today (international news/analysis)
2300	BBC (Eu/N Af)	The World Today (international news/analysis)
2300	BBC (E As/Pa/Au)	The World Today (international news/analysis)

Tuesdays

2300	BBC (Am)	The World Today (international news/analysis)
2300	BBC (Eu/N Af)	The World Today (international news/analysis)
2300	BBC (E As/Pa/Au)	The World Today (international news/analysis)

Wednesdays

2300	BBC (Am)	The World Today (international news/analysis)
2300	BBC (Eu/N Af)	The World Today (international news/analysis)
2300	BBC (E As/Pa/Au)	The World Today (international news/analysis)

Thursdays

2300	BBC (Am)	The World Today (international news/analysis)
2300	BBC (Eu/N Af)	The World Today (international news/analysis)
2300	BBC (E As/Pa/Au)	The World Today (international news/analysis)

Fridays

2300	BBC (Am)	The World Today (international news/analysis)
2300	BBC (Eu/N Af)	The World Today (international news/analysis)
2300	BBC (E As/Pa/Au)	The World Today (international news/analysis)
2330	BBC (E As/Pa/Au)	Global Business (about international business)

Saturdays

2300	BBC (Am)	The World Today (international news/analysis)
2300	BBC (Eu/N Af)	The World Today (international news/analysis)
2300	BBC (E As/Pa/Au)	The World Today (international news/analysis)
2330	BBC (Am)	Arts in Action (global arts magazine)
2330	BBC (E As/Pa/Au)	Arts in Action (global arts magazine)
2330	BBC (Eu/N Af)	Arts in Action (global arts magazine)

Hauser's Highlights

ALBANIA: Radio Tirana

Albanian to Nam:
0000-0430 on 6090, 7270
English, complete:
0130-0145 6115, 7160 Nam
0330-0400 6115, 7160 Nam
1715-1730 7210, 9510 Eu
2230-2300 7130, 9540 Eu
(Ivo and Angel, *Observer*, Bulgaria)

Thank You ...

Additional Contributors to This Month's Shortwave Guide:

Adrian Sainsbury, Radio New Zealand; Clyde W. Harmon, Anniston, AL;
Glenn Hauser, Enid, OK/*World of Radio, DX Report*; Hans Johnson, WY/
Ulis Fleming, MD/*Cumbre DX/DXing With Cumbre*; Michael Murray, UK;
; George Woods/*Media Scan*; BBCM; *BBC On-Air*; Harold Sellers, *DX
Ontario*; Alexander Yegorov, Radio Ukraine Intl; *Hard Core DX*; Radio
Sweden/*Media Scan*; Usenet Newsgroups; *Worldwide DX Club*

How To Use This Table

The *Monitoring Times* propagation table is set up to cover three main areas of the continental US and similar circuits are calculated for each area. If you live in Canada or along the 49th parallel, and have access to the Internet, you can check the following sites for similar tables for the Canadian and northern US users at <http://www.odxa.on.ca/rac2txt99.htm>.

In the *MT* tables and on the Canadian web site, the OWF (Optimum Working Frequency) frequency for a particular circuit is displayed. This frequency should give you the best chance, 90% of the time, to hear a station located at the other end of the circuit. If you feel adventurous, look up higher than the OWF for possible signals.

The tabulated OWF is approximately equivalent to 80% of the MUF (Maximum Usable Frequency) so you could still go up in frequency in your search for a signal. For example, if the tabulated OWF is 8.0 MHz, the MUF would be 10 MHz, so you could go lurking in the upper reaches up to 10 MHz. When you reach the MUF, your chances of hearing a good signal have now decreased to about 10%. When the solar activity is high you might find some of the MUF in the 35 to 45 MHz area; you never know what you can find "up there."

The OWF can, at times, have a calculated value of "0". This value is replaced by an asterisk (*) and the cells are shaded in the *Monitoring Times* chart and on the Web pages. When you see this, do not despair; keep on looking in the vicinity of the last frequency listed for that circuit. The reason why the OWF can have a calculated value of "0" is simply that the ALF (Absorption Frequency) on this circuit, at that particular time of day, is higher than the OWF and, in theory, communication at the OWF should be impossible. But I have been in the radio field long enough to know that theory and practice do not always agree!

As it is relatively safe to assume reciprocity in the forecasts most of the time, the *MT* circuits are labeled "TO/FROM." There are some technical arguments against this assumption, but we know that the *MT* forecasts have been used with success by overseas listeners to listen to North American broadcasts.

A "P" after the name of a circuit indicates that the signal on that particular circuit can be influenced by auroral zone disturbances while traveling over the pole.

Enjoy DXing and use the propagation charts to help you locate unusual signals.

OPTIMUM WORKING FREQUENCIES (MHz)

For December 2000 Flux=184 SSN=144

Predictions prepared using ASAPS for Windows®

UTC	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
TO/FROM US WEST COAST																								
CARIBBEAN	18	15	14	13	12	11	10	10	9	8	8	9	9	9	14	22	27	27	27	25	25	25	24	21
SOUTH AMERICA	20	19	18	17	14	12	11	11	11	10	10	10	*	*	17	25	25	25	24	24	23	23	22	21
WESTERN EUROPE	8	8	8	8	8	9	9	9	10	9	9	9	9	9	10	14	21	21	17	14	12	10	9	8
EASTERN EUROPE (P)	8	8	8	8	9	9	10	10	10	10	9	9	9	10	10	13	18	14	12	10	*	*	*	8
NORTH AFRICA	13	13	12	12	12	12	12	11	11	*	*	*	*	*	12	18	25	24	22	19	15	14	13	13
CENTRAL AFRICA	23	21	18	16	13	13	12	12	*	*	*	*	*	*	13	19	26	32	33	33	34	30	27	25
SOUTH AFRICA	21	19	18	17	14	13	13	*	*	*	*	*	*	*	15	24	25	24	24	24	25	27	26	22
MIDDLE EAST (P)	11	11	11	12	14	12	11	*	*	*	*	*	*	10	10	12	19	16	13	12	12	12	12	11
CENTRAL ASIA (P)	12	12	19	19	15	12	11	*	*	9	9	9	9	9	10	10	11	11	11	11	11	11	11	11
INDIA (P)	12	19	24	20	16	*	*	*	*	*	9	9	9	9	9	9	13	14	13	13	12	11	11	11
THAILAND	27	30	26	22	17	*	*	*	*	*	9	9	9	9	9	9	12	18	17	16	14	12	11	14
AUSTRALIA	26	26	27	24	20	17	*	*	12	12	12	11	11	10	10	11	16	22	21	20	19	22	24	25
CHINA	21	30	26	21	17	13	11	10	9	9	9	9	9	9	9	9	11	12	11	11	11	11	12	14
JAPAN	30	28	25	20	16	13	11	10	9	9	9	9	9	9	9	9	10	9	9	*	10	16	24	31
SOUTH PACIFIC	23	22	22	20	17	14	11	11	10	10	10	10	9	8	8	11	13	17	23	22	23	23	22	23
TO/FROM US MIDWEST																								
CARIBBEAN	19	16	14	12	11	10	10	10	9	9	8	9	11	19	26	29	30	30	29	28	27	27	26	22
SOUTH AMERICA	23	21	18	16	14	14	13	14	13	12	11	11	13	23	31	30	30	29	29	28	28	28	27	26
WESTERN EUROPE	10	10	9	10	10	10	10	11	11	12	12	12	12	15	21	28	29	25	21	17	14	13	12	11
EASTERN EUROPE (P)	7	7	7	8	8	8	9	11	11	11	10	11	11	12	17	23	20	15	12	10	*	8	7	7
NORTH AFRICA	13	13	12	12	12	12	13	12	12	12	*	*	*	15	21	27	28	23	21	19	16	14	13	13
CENTRAL AFRICA	25	22	19	17	14	14	14	14	13	13	*	*	*	20	28	33	37	37	35	34	34	32	29	26
SOUTH AFRICA	20	19	18	15	14	14	14	13	*	*	*	*	*	21	26	25	25	24	24	24	25	27	26	22
MIDDLE EAST	12	12	12	12	14	13	13	13	12	12	12	12	13	14	19	23	21	18	14	13	13	13	12	12
CENTRAL ASIA (P)	11	11	15	15	14	13	12	12	12	12	12	12	12	12	14	13	12	11	11	11	11	11	11	11
INDIA	11	15	17	15	14	12	*	*	*	*	*	11	11	11	13	19	19	14	13	13	13	12	11	11
THAILAND	23	22	19	16	14	*	*	*	*	*	10	10	10	11	11	16	18	16	16	14	14	12	11	12
AUSTRALIA	26	26	23	20	17	*	*	*	12	12	11	11	11	10	12	18	24	22	21	20	19	22	24	25
CHINA (P)	18	22	19	16	14	12	11	11	11	11	11	11	11	11	12	12	12	12	11	11	11	11	12	13
JAPAN	29	25	21	17	14	12	11	10	10	10	10	10	10	10	10	11	10	10	*	*	*	15	25	32
SOUTH PACIFIC	25	25	22	18	15	13	11	11	11	11	10	10	9	10	13	15	15	20	26	25	25	25	24	25
TO/FROM US EAST COAST																								
CARIBBEAN	12	11	9	9	8	8	8	7	6	6	6	7	13	18	20	21	21	20	20	19	18	18	17	15
SOUTH AMERICA	20	18	16	15	14	13	13	12	11	9	10	12	23	28	28	26	26	26	25	24	24	24	23	22
WESTERN EUROPE	10	10	10	9	9	9	10	10	11	11	11	12	18	26	32	32	30	27	23	19	16	14	12	11
EASTERN EUROPE	8	8	8	8	8	8	9	11	11	11	10	11	15	23	28	26	21	16	13	11	10	9	8	8
NORTH AFRICA	13	13	12	12	12	11	12	12	12	11	11	13	20	27	29	28	27	23	21	19	16	15	14	14
CENTRAL AFRICA	21	18	16	14	14	13	13	13	12	*	*	16	25	30	34	34	34	34	31	31	31	29	26	23
SOUTH AFRICA	20	18	16	15	14	15	14	13	*	*	*	19	26	26	25	25	25	24	24	24	25	26	26	23
MIDDLE EAST	12	12	12	12	13	13	13	12	12	12	12	12	18	27	27	24	22	20	16	14	13	13	13	13
CENTRAL ASIA (P)	11	12	13	16	14	14	13	13	13	13	13	13	15	21	19	15	12	11	11	11	11	11	11	11
INDIA (P)	11	13	17	14	13	13	*	*	*	*	12	12	14	21	26	24	21	16	14	13	13	12	11	11
THAILAND (P)	17	20	17	15	14	13	*	*	*	12	12	12	13	17	24	24	19	16	15	15	14	12	11	11
AUSTRALIA	26	25	20	16	*	*	*	13	13	12	12	12	12	14	23	25	24	22	21	20	19	22	24	25
CHINA (P)	14	20	18	15	14	13	13	12	12	12	12	12	12	15	13	12	11	11	11	*	11	11	11	12
JAPAN	26	23	20	17	15	14	13	13	12	12	12	12	12	12	12	11	11	*	*	11	11	15	25	29
SOUTH PACIFIC	26	22	18	16	14	13	12	12	12	12	11	11	11	16	17	16	17	23	28	27	27	27	27	27

* Unfavorable conditions: Search around the last listed frequency for activity.

(P) denotes circuit across polar auroral zone; reception may be poor during ionospheric disturbances.

Half Full or Half Empty?

To be sure, the decision by **Radio Netherlands** to end its popular *Media Network* program in October was a deep disappointment. But perhaps what was even more disappointing was the disrespectful and detrimental reaction by some in the radio listening community.

When Jonathan Marks made the announcement in September, it would be an understatement to say that the decision came as a surprise. However, maybe we just weren't paying proper attention. The program's copresenter, Diana Janssen, had just recently announced her intention to leave the program for another professional opportunity. It was also becoming more and more evident that events in the telecommunications field were taking place at an increasingly dizzying rate – moving beyond the ability to properly chronicle, let alone analyze, in the space of a 25-minute weekly radio magazine.

Parenthetically, I can remember not too long ago, as I began my career in the telecommunications field, when it was nearly impossible to find a single article on any aspect of the field in the space of a week in the business pages of prominent newspapers like *The New York Times* and *The Wall Street Journal*. Today, the topic is driving the global economy and dominating the media in all its forms. In a way that even Marshall McLuhan didn't anticipate, the media really has become the message.

The bottom line is that even though we weren't paying close enough attention, *Media Network* was. After two decades of following such trends, who was in a better position than Jonathan Marks to make this kind of a decision? Not some of his listeners, if their behavior is any indication.

It's clear that at least one of the things we have learned is how to be demanding consumers. We want what we want, when we want it, with no thought or concern about whether what we want is justified, nor of what it might take for someone to get it to us. Sadly, that kind of behavior was clearly in evidence when the decision to end *Media Network's* run was announced.

This conduct is becoming typical of all too many in the radio listening and hobbyist community. If there is one inevitability beyond death and taxes, it is certainly *change*. Resisting it is about as effective as standing in front of the ocean and trying to stop a wave with one's hands. Like it or not, you're going to get wet.

Unfortunately, intransigent attitudes like this are only serving to spoil the high regard in which radio professionals once held those in the hobbyist and listening community. Yes, the blame for this hardly falls on just one side of that relationship. But, if you don't think we are living in a highly competitive world where the ability to adapt is the key to survival (let alone happiness and contentment), then, you're just not paying attention.

Radio Netherlands has consistently shown itself to be of the highest professional caliber in both its programming and in its dealings with listeners. Why should any of us think that this has changed? Looking for a villain or a conspiracy in all this is just plain stupid.

Now that the shock has worn off, the proper response to Jonathan Marks and his team at **Radio Netherlands** – even at this late date – is appreciation for all that came before and acceptance (even excited anticipation) of what's coming in the future. I, for one, am hoping that a few of those fine radio documentaries that **RN** produces so well might have a radio safari in the offing now and then. And, with Andy Sennitt at the helm, I have every confidence that the *Media Network* webzine, which gladly is to continue, will keep me up to date with what I need to know.

You know, that glass really is more than half full.

❖ The Education Station

If **Radio Netherlands** deserves its reputation for producing the best documentaries on radio, then **Radio Australia** should get the same full marks for its efforts in using radio to educate.

When **RA** refocused its mission a few years ago after a particularly severe budget cut, it stated its intention to produce, in partnership with Australian universities, worthy educational programs on a range of relevant topics for its audiences in Asia and the Pacific (and around the world).

All **Radio Australia** has done in the interim is co-produce and broadcast four outstanding series, most in multiple languages. They are:

- *Money, Markets and the Economy*, produced with Monash University to shed some light on the curious and complex worlds of economics and finance.

- *In the Pipeline*, also produced with Monash University, looking at issues we face in the digital age of converging communications.

- *Carving Out*, a multimedia series on development in the Pacific in which Pacific Islanders talk about cultural identity, health, education and the state of their environment, while voicing their practical solutions to the big questions affecting the region.

- *Globally Speaking: The Politics of Globalisation*, a series examining how the processes of globalization are affecting human rights, the nation state, democracy and the economy.

Currently, while working on a new series that will debut early in the new year, **Radio Australia** has turned to its domestic partner's *Learning for Life* unit for a university-style course on human communications entitled *Lines of Communications*. "Beginning with the premise that communication is fundamental to the human condition, *Lines of Communication* surveys the broad-scale theories and practices which have come to define this burgeoning discipline," says a course description on its web site.

UT air times on **RA** are Fridays 1830, Saturdays 0530 and Sundays 0030 and 2130; and Sundays via the **World RadioNetwork** at 0705. By the time this *MT* reaches you, the first six installments of this thirteen-part series will have been broadcast. But *no worries mate*, every program in this and all the previous series is available in on-demand audio and transcript form, in addition to other interesting and relevant supporting materials, from <<http://www.abc.net.au/ra/education/>>.

Happy Holidays and best wishes for the New Year!

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Single Channel Per Carrier (SCPC) Services

By Robert Smathers, roberts@nmia.com

An SCPC transmitted signal is transmitted with its own carrier, thus eliminating the need for a video carrier to be present. Dozens of SCPC signals can be transmitted on a single transponder. In addition to a standard TVRO satellite system, an additional receiver is required to receive SCPC signals.

The frequency in the first column is the 1st IF (typical LNB frequency) and the second column frequency (in parentheses) is the 2nd IF (commercial receiver readout) for the SCPC listing. Both frequencies are in MHz.

GE-2 Transponder-Vertical 13 (C-band)

1178.70 (81.3) NASA space shuttle audio (missions only)

Galaxy 4R Transponder 1-Horizontal (C-band)

1443.80 (56.2) Voice of Free China (International Shortwave Broadcaster) Taipei, Taiwan
1443.60 (56.4) KBLA-AM (1580) Santa Monica, CA—Radio Korea
1438.30 (61.7) WWRV-AM (1330) New York, NY—Spanish religious programming and music, ID—Radio Vision Christiana de Internacional

Galaxy 4R Transponder 3-Horizontal (C-band)

1404.60 (55.4) WGN-AM (720) Chicago, IL—news and talk radio
1404.40 (55.6) WMVP-AM (1000) Chicago, IL—"ESPN Radio 1000"/Bulls NBA radio network
1404.20 (55.8) Tribune Radio Networks/Wisconsin Radio Network
1402.90 (57.1) USA Radio Network
1402.00 (58.0) Occasional Audio
1401.80 (58.2) People's Radio Network
1401.50 (58.5) Occasional Audio
1399.00 (61.0) Sports Byline USA/Sports Byline Weekend/On Computers Radio Show
1398.80 (61.2) Talk Radio Network (TRN)
1397.50 (62.5) Minnesota Talking Book Radio Network—reading service for the blind
1397.10 (62.9) Wisconsin Radio Network/Wisconsin college sports
1396.70 (63.3) Radio America Network
1395.80 (64.2) WTMJ-AM (620) Milwaukee, WI—talk radio/Packers NFL radio network/Wisconsin college sports
1395.50 (64.5) Michigan News Network—network news feeds
1395.00 (65.0) Occasional audio
1394.70 (65.3) WJR-AM (760) Detroit, MI—news and talk radio/Michigan News Network/Michigan college sports
1383.10 (76.9) KIRO-AM (710) Seattle, WA—news and talk radio/Seahawks NFL radio network

1382.90 (77.1) Michigan News Network/Red Wings NHL radio network
1382.60 (77.4) Soldiers Radio Satellite (SRS) network—U.S. Army information and entertainment radio
1382.30 (77.7) Motor Racing Network (occasional audio) NASCAR racing
1382.00 (78.0) Occasional audio
1381.60 (78.4) KEX-AM (1190) Portland, OR—news and talk radio/Trailblazers NBA radio network
1381.40 (78.6) Occasional audio/Washington college sports
1381.20 (78.8) KJR-AM (950) Seattle, WA—sports talk radio/Supersonics NBA radio network
1380.90 (79.1) Occasional audio
1377.10 (82.9) In-Touch—reading service
1376.00 (84.0) Kansas Audio Reader Network—reading service

Anik E2 Transponder 1-Horizontal (C-band)

1446.00 (54.0) Canadian Broadcasting Corporation (CBC) Radio-North (Quebec) service

Anik E2 Transponder 5-Horizontal (C-band)

1366.00 (54.0) Canadian Broadcasting Corporation (CBC) Radio-North (Eastern Arctic) service

Anik E2 Transponder 7-Horizontal (C-band)

1326.00 (66.0) Canadian Broadcasting Corporation (CBC) Radio-North (MacKenzie) service
1325.50 (65.5) Canadian Broadcasting Corporation (CBS) Radio—Occasional feeds/events
Anik E2 Transponder 17-Horizontal (C-band)
1126.00 (54.0) Canadian Broadcasting Corporation (CBC) Radio-North (Western Arctic) service
1125.50 (54.5) Canadian Broadcasting Corporation (CBC) Radio-North (Newfoundland and Labrador) service

Anik E2 Transponder 23-Horizontal (C-band)

1006.00 (54.0) Societe Radio-Canada (SRC) Radio-AM Network
1005.50 (54.5) Canadian Broadcasting Corporation (CBC) Radio-North (Yukon) service

Anik E1 Transponder 21-Horizontal (C-band)

1036.70 (63.3) Wal-Mart In-store music
1037.00 (63.0) Wal-Mart In-store music
1037.50 (62.5) Wal-Mart In-store music

Galaxy 10R Transponder 4 (Ku-band)

1012.75 (87.25) Wal-Mart In-store network
1013.15 (86.85) Sam's Club In-store network
1013.50 (86.50) Wal-Mart In-store network
1013.95 (86.05) Wal-Mart In-store network
1014.25 (85.75) Sam's Club In-store network
1014.75 (85.25) Wal-Mart In-store network
1015.05 (84.95) Wal-Mart In-store network

RCA C5 Transponder 3-Vertical (C-band)

1404.60 (55.4) Wyoming News Network/Northern Ag Network/Wyoming college sports
1400.60 (59.4) Learfield Communications/Indiana college sports
1400.40 (59.6) Learfield Communications/MissouriNet
1400.20 (59.8) Learfield Communications/Rams NFL radio network/Purdue college sports
1400.00 (60.0) Learfield Communications
1396.60 (63.4) Kansas Information Network/Kansas Agnet—network news feeds
1396.40 (63.6) Liberty Works Radio Network
1396.20 (63.8) MissouriNet/Illinois college sports
1395.90 (64.1) Western Montana Radio Network/Red River Farm Network/Montana college sports
1395.70 (64.3) MissouriNet/Kansas State college sports
1386.40 (73.6) Learfield Communications/Blues NHL radio network
1386.20 (73.8) Occasional Audio
1384.00 (76.0) Occasional Audio/Missouri college sports
1383.80 (76.2) Learfield Communications
1383.40 (76.6) Occasional Audio
1382.90 (77.1) MissouriNet/Illinois college sports
1382.10 (77.9) Learfield Communications/MissouriNet/Blues NHL radio network

SATELLITE RADIO GUIDE



SATELLITE LOADING REPORT OF THE MONTH

Morelos 2 at 120 degrees West longitude

C-band

1(H)	(none)
2(V)	(none)
3(H)	(none)
4(V)	(none)
5(H)	(none)
6(V)	(none)
7(H)	(none)
8(V)	(none)
9(H)	(none)
10(V)	(none)
11(H)	(none)
12(V)	(none)
13(H)	(none)
14(V)	(none)
15(H)	(none)
16(V)	(none)
17(H)	(none)
18(V)	(none)
19(H)	Data Transmissions
20(V)	(none)
21(H)	(none)
22(V)	(none)
23(H)	(none)
24(V)	(none)

Ku-band

T01K(H)	11764	(none)
T02K(H)	11888	(none)
T03K(H)	12012	(none)
T04K(H)	12136	(none)

Galaxy 10R at 123 degrees West longitude

C-band

1(V)	Data Transmissions
2(H)	Data Transmissions

3(V)	Data Transmissions
4(H)	Data Transmissions
5(V)	Viacom services (digital)
6(H)	Data Transmissions
7(V)	TVN (digital)
8(H)	Data Transmissions
9(V)	TVN (digital)
10(H)	(none)
11(V)	(none)
12(H)	TVN (digital)
13(V)	TVN (digital)
14(H)	Sundance Channel (VC2 +)
15(V)	Showtime-West (VC2 +)
16(H)	M2: Music Television
17(V)	Nickelodeon-West (VC2 +)
18(H)	The Movie Channel (TMC) - West (VC2 +)
19(V)	MTV-West (VC2 +)
20(H)	(none)
21(V)	ESPNNews (VC2 +)
22(H)	ESPN/ESPN Classic/ESPNNews (digital)
23(V)	A&E - West (VC2 +)
24(H)	Outdoor Channel

Ku-band

1(V)	11720	(none)
2(H)	11740	Data Transmissions
3(V)	11760	(none)
4(H)	11780	Wal-Mart TV (digital)/Wal-Mart In-store audio/Data Transmissions
5(V)	11800	(none)
6(H)	11820	Data Transmissions
7(V)	11840	Data Transmissions
8(H)	11860	Data Transmissions
9(V)	11880	(none)
10(H)	11900	Data Transmissions
11(V)	11920	Data Transmissions
12(H)	11940	Data Transmissions
13(V)	11960	(none)

14(H)	11980	Data Transmissions
15(V)	12000	Data Transmissions
16(H)	12020	Data Transmissions
17(V)	12040	(none)
18(H)	12060	Data Transmissions
19(V)	12080	(none)
20(H)	12100	(none)
21(V)	12120	(none)
22(H)	12140	(none)
23(V)	12160	(none)
24(H)	12180	(none)

Galaxy 5 at 125 degrees West longitude

1(H)	Disney-East (VC2 +)
2(V)	Playboy Channel (VC2 +)
3(H)	Trinity Broadcasting Network (TBN)
4(V)	Sci-Fi Channel (VC2 +)
5(H)	CNN (VC2 +)
6(V)	TBS (VC2 +)
7(H)	WGN (VC2 +)
8(V)	HBO-West (VC2 +)
9(H)	ESPN (VC2 +)
10(V)	Infomercials
11(H)	FOX Family Channel - East (VC2 +)
12(V)	Discovery Channel - East (VC2 +)
13(H)	CNBC (VC2 +)
14(V)	ESPN2 (VC2 +)
15(H)	HBO-East (VC2 +)
16(V)	Cinemax - West (VC2 +)
17(H)	TNT - East (VC2 +)
18(V)	TNN - East (VC2 +)
19(H)	USA Network - East (VC2 +)
20(V)	Black Entertainment TV (VC2 +)
21(H)	(none)
22(V)	CNN Headline News (VC2 +)
23(H)	A&E - East (VC2 +)
24(V)	Showtime - East (VC2 +)

RadioMap™

Transmitter sites in your area are researched and marked on a beautiful 11 x 17 full color plot. See FCC licensed sites from VLF through microwave plus selected FAA transmitter sites. Call signs, frequencies, and names provided. Ham radio stations excluded.

You choose the map center location - anywhere within the United States. We adjust map coverage for best readability. Deluxe report includes additional index by frequency and local spectrum occupancy chart.

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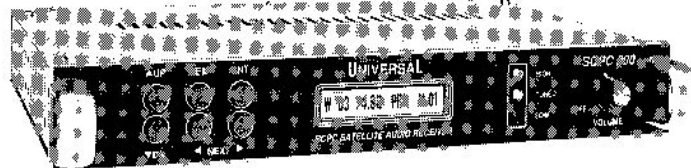
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4DTV Saves the Day (Maybe)

The satellite TV industry has a cyclical history of boom and bust. From 1978 to 1986 the original C-band industry enjoyed wild growth. However, in '86 the introduction of encryption blew the wheels right off the train and the industry sailed off the tracks. Strong, industry-wide growth came slowly and continued until 1994 when the small dish revolution caused another train wreck. The industry has never recovered and, according to one trade group, continues to lose 20,000 viewers per month year round.



It took two years for industry giant General Instrument (GI) to respond to this last bust and by 1996 it was offering what it believed was the ultimate in satellite TV receivers. Dubbed 4DTV, GI's product could receive traditional analog channels, VideoCipherII (VCII) encrypted channels, DigiCipherII (DCII) digital channels and DigiCipherII encrypted channels. The four main transmission modes of the late 90s could all be tuned in by this one receiver. Unfortunately, the first 4DTV receivers didn't debut until mid-1997. By then the DBS craze was in full frenzy. Viewers were attracted to the small dish system's ever decreasing cost, minimum landscape impact antenna and growing number of channel offerings.

While system prices have declined greatly since their introduction, escalating programming fees have made disgruntled customers of some original viewers. Meanwhile, GI was sold to Motorola which has seen fit to pour more money into the 4DTV project to produce a second generation 4DTV receiver. Could the time be right for another C-band boom?

❖ Not All It Could Be

This past summer Motorola planned to introduce its new version of 4DTV, but typically, ran into a few production problems. Now, Ajamu Bernard, 4DTV Marketing Manager, says the revised receiver should be at dealers by the time you read this. Bernard also says there will be essentially four improvements on the basic 4DTV design: 1) beef up the audio to Dolby AC3 quality, 2) improve internal software to allow the tuner to run faster, 3) the addition of a baseband video connection which allows consumers to use "stand alone" devices such as GI's HDTV decoder, and 4) a "four-way" remote

ably over \$1,000) for some time to come. Ordinarily this would be a terrific way to run a business, but, with consumers literally abandoning their C-band systems in the field at the rate of more than a quarter of a million per year, Motorola could be faulted for helping to scuttle the ship it's supposed to be righting.

❖ Now the Good News

Having harped on Motorola's uncanny sense of timing and pricing policies, you might assume that I don't care much for this receiver. Wrong! It is the best C-band satellite receiver on the market. Let me go further: It's the best full-function, C/Ku-band receiver ever made. Here is a receiver which tunes all the analog, VCII, and DCII audio and video services on both C and Ku-bands in a nearly seamless fashion. Viewers will be hard pressed to know when the unit has switched from C-band to Ku-band; from VCII to DCII, from analog to digital. It's simply an amazing feat of electronic engineering.

But wait, there's more! Built into the software is a complete on-screen guide which not only tells the viewer what's on, but what will be on next hour, or the next, or the next after that. In addition, by scrolling through the guide, highlighting each program, the viewer can hit the "info" button and find out just what the program is.

Last minute changes don't make it into your printed guide? Not a problem with 4DTV. At night, while you're fast asleep, the receiver turns itself on, commands the dish to go to Galaxy 10 to download all the programming schedule information for the next day. To watch any program listed in the on-screen guide simply highlight it with the "up/down" buttons on the re-

control which allows the viewer to control any contemporary TV set, VCR, or stereo amplifier in addition to controlling the 4DTV.

Unfortunately, one of the drawbacks of the delay in making available this minimal redesign is that virtually all the inventory of the original version of 4DTV has been sold, thereby creating an instant shortage. This contrived shortage coupled with the slow ramp-up of production further guarantees that street prices for the new 4DTV will remain at or possibly above manufacturer's suggested retail price (consider-



Rear panel of 4DTV features C/Ku-band LNB inputs, S-video output, fixed and variable audio outputs, external antenna input (for terrestrial TV), baseband video output (for stand-alone decoders), and slot for VCII decoder module. (Courtesy Motorola)



Sparse layout for Motorola's 4DTV belies its amazing capabilities. This receiver brings in over 500 channels of analog, VCII and DCII programming. (Courtesy Motorola)

remote and press the "enter" button. The receiver sends the dish to the proper satellite and tunes the proper channel. You don't have to know where anything is.

The front panel of the 4DTV looks like any other digital receiver, but there are some differences worth noting. In addition to the green LED channel read-out, there's an LED to indicate when you've tuned in a VCII channel or DCII channel. Most functions keyed on the 4DTV remote can be accessed from the three extra front panel buttons. There's also a drop-down door for access to a "smart card" reader slot should one be needed in the future.

❖ Installation and Set-up

Installing and setting up a 4DTV receiver to replace your current receiver is not difficult. The receiver is packed with three well designed publications: *4DTV Viewer's Handbook* (explains all the 4DTV features); *4DTV Reference Guide* (details installation procedures including a list of TV, VCR, Stereo and Cable Box codes for single remote operation of all your affiliated devices); and an 18" x 24" fold-out poster with step-by-step procedures carefully laid out.

Among the conveniences 4DTV offers is the ability to record up to three different programs or movies each day just by setting the on-screen timers. There are two sets of guide "favorites" which allow you to customize the on-screen guide to include only those channels of interest to you. This reduces the size of the guide to a more manageable level.

While you're watching a program you may call up the on-screen guide, reduce it to one third the screen size so that you can still watch the program while channel surfing. You can get the guide to call up only those channels listed in six different categories (Movies, News, Sports, Music, Networks, Pay-Per-View). This lets you get right to whatever it is you want to see without having to sort through the hundreds of available channels.

If you have current subscriptions on VCII channels your VCII module slips right into the

back of the receiver and provides seamless programming with the DCII programming. You'll find that you'll need to keep your VCII module operating because quite a few popular channels (such as TBS, the Weather Channel, etc.) are not yet available in DCII mode.

There's not enough room on these two pages to list the hundreds of analog, VCII or DCII channels you can receive with 4DTV. But that's not all: Among the great things you'll find, once you've done the installation, are the 80 plus channels of commercial free, announcer free music. Renown music service provider, DMX, has 43 channels of as many different formats of music while Music Choice, DMX's competitor, has 45 channels in their own formats. Both services are free to DCII owners. Both services display current songs along with their album names, artist, and composer on-screen while the song is playing.

❖ Looking to the Future

Motorola knows that not everyone who's staying with big dish satellite TV wants to abandon their current receiver for a new 4DTV so they're working on a unit they call the "Digital Sidecar" (DSR-905) which should be out by mid 2001. This product is designed to be used as a 4DTV "slave" receiver, converting DCII signals into analog signals along with the ability to display the Interactive Program Guide.

Motorola also has an HDTV decoder module (HDD-200) designed to receive programming sent in the DCII HDTV format. The wide-screen 16:9 ratio output must be seen on a wide-screen HDTV set. The HDD-200 is already available at \$900, but, with only a few HDTV channels being transmitted and the price of HDTV sets over \$2,000, it's a product for the electronic elite.

❖ Last Word

4DTV will not receive FTA MPEGII signals and there are very few wild feeds using the DCII mode though it is in wide use among Public TV networks. Furthermore, reception of 4DTV digi-

tal signals via C/Ku-band systems requires at least an 8-ft. dish.

As mentioned, prices for the new 4DTV receivers will be at a premium. For discounted prices your best bet is to look for a used 4DTV receiver or find someone switching over to the small dish. Prices for used receivers should be much cheaper and, given the quality of the products, they should last a long time.

It won't be too many years before the bulk of all "cable" type programming is done via the DCII mode. The proliferation of DCII channels throughout the Clarke Belt indicates that we'll all need DCII reception capability in the future.

For a list of available 4DTV channels see <http://www.gi.com>. For prices see your local dealer or call Skyvision 800-500-9275.

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Performance Anxiety

The first images from a newly launched weather satellite (WXSAT) are always awaited with great interest. Although launches are considered “old hat,” nothing is ever certain until those first beeps are heard from the APT (automatic picture transmission) transponder. The fact that problems can still happen during launch and deployment is only too evident when listening to the APT from Meteor 2-21. This was switched back on some weeks ago while Meteor 3-5 was off. Its antenna is believed to have failed to attain the correct configuration, leading to poor and uneven signal transmission characteristics.

A large number of people were standing by their receivers when NOAA-L was launched on September 21. I took the opportunity to watch the launch via a streaming video link from NASA on the Internet – the first time that this opportunity has arisen for me. It was really impressive to see the launch in real-time, and it was only a few hours later that updated Kepler elements became available. NOAA (National Oceanographic and Atmospheric Administration) staff had issued preliminary Kepler elements to enable users of satellite tracking software to know approximately when to expect the satellite to come over the local horizon. In fact, even these were not essential, except to users of high resolution imagery – who need to use a tracking antenna for the 1707 MHz signal.

Within hours of transmissions being enabled, regular correspondents to the WXSAT forums had posted their first images from NOAA-L on their web sites. American monitors had first go at NOAA-L because transmissions did not commence during the satellite's pass over Britain. I waited next to my receiver wondering when I would hear the 137.62 MHz transmission – but this did not happen during these first few orbits. Reports indicated that only when the satellite was passing over the east coast of America, was it commanded on. Lucky folk – but after all, it was launched by NOAA!

❖ NOAA-L early orbit images

Jim Scheffler was amongst the first to capture NOAA-L APT transmissions during the first flight transmitting over the east coast. His image clearly shows the southern coastline of Greenland near top-left, as well as the cloud systems over the east coast. Jim lives in Southern New England, Massachusetts, where he has a variety of receiving equipment.

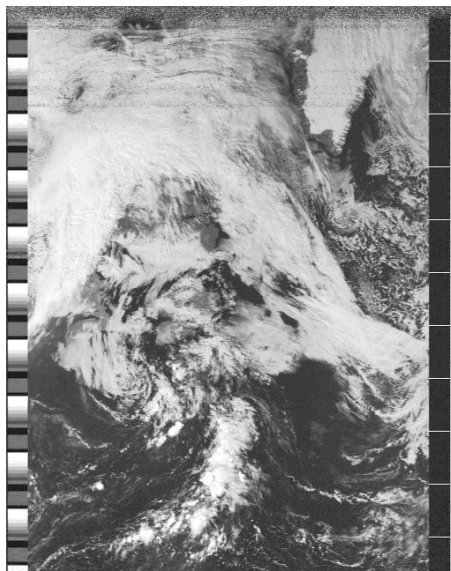


Fig 1: NOAA-L September 21, 1643 UTC from Jim Scheffler
<http://webpages.charter.net/jim1764/weathersats/>

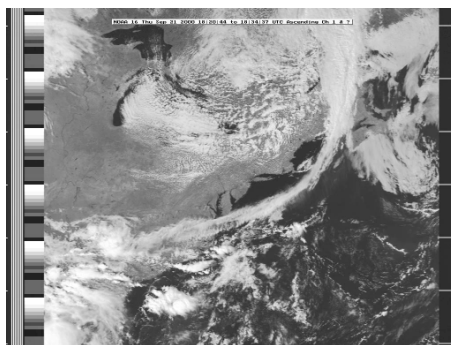


Fig 2: NOAA-L September 21, 1820 UTC from Ronnie Holman
<http://adsl-77-240-77.rdu.bellsouth.net/weather>

Milan Konecny also processed his first NOAA-L image for display on his web site at: <http://www3.sympatico.ca/konecny/weather.htm> Figure 3 was captured by David Brooks from a near overhead NOAA-L pass to the west of Barbados. This twin-channel view is only seen during the early days of testing, while both the visible-light channels are active. David commented that image quality was great and the signal strength was good.

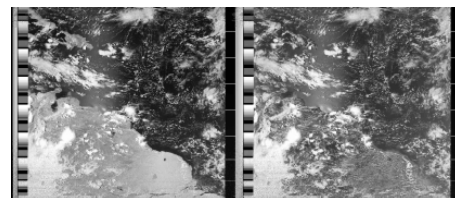


Fig 3: NOAA-L twin channel September 23, 2000, at 1745 UTC from David Brooks
<http://www.brohavwx.com/ORBITOR.jpg>

❖ NOAA-16 infrared

By their very nature, infrared (thermal) sensors are sensitive to heat radiation – and to perform effectively, they must be cooled. When a satellite first attains orbit, its surfaces contain absorbed gases and possibly other contaminants, so a period of time must elapse before such temperature sensitive systems can be activated. Within a few days of exposure to the vacuum of space, the gases are dispelled, and after two weeks or so, the system has stabilized and is ready for operations.

The channel 3A (long visible) sensor on NOAA-16 was commanded on with channels 1 and 2. Channel 3B is the normal infrared channel (along with channels 4 and 5) that is commanded on after out-gassing of those detectors is complete.

In normal operation, 3A will be used part of the time, alternating with 3B. In order to preserve the 5-channel HRPT format for all the legacy HRPT systems that exist, they cannot both be on simultaneously. NOAA-15 also has a channel 3A, but it was only on for very limited periods to gather some data sets for testing. Channel 3A was considered more of an experimental channel on NOAA-15, while it will be operational on NOAA-16.

NOAA plans to develop a schedule of channel 3A operations, to ensure that it will be in use to best utilize its sensing capabilities; that schedule will be announced in due course. Channel 3B is likely to be used more often than 3A. Thanks to Wayne Winston of NOAA for this latest information.

❖ Replacing NOAA-14

NOAA-L (now NOAA-16) was designed to replace NOAA-14. If you already receive APT or HRPT from NOAA-14, you might wonder why the latter should need a replacement spacecraft. A look behind the scenes will answer this question. NOAA-J (14) was launched on De-

ember 30, 1994, into an afternoon orbit, and is currently designated as the operational "afternoon" satellite. A few hours after launch, a regulator valve leak caused the spacecraft to experience an attitude (direction pointing) anomaly. The satellite was recovered within hours and remained in a stable orbit. In January 1995, it was determined that one of the four Space Environment Monitor (SEM) telescopes was inoperative, reducing data collection by 12 percent.

In February 1995, the SARP (Search and Rescue Processor) failed, then the SBUV/2 (Solar Backscatter Ultra-violet Radiometer) Cloud Cover Radiometer (CCR) failed, and DTR (digital tape recorder) 4A/4B became inoperable. The ESA (Earth Sensor Array) exhibited high data counts due to apparent contamination of the detector. In March 1995, the MSU (Microwave Sounding Unit) scanner seized and the instrument was powered off. After three weeks, the MSU was powered on and has been operating satisfactorily since then. Flight software was modified in April 1995, to correct the high ESA Q3 counts, and to turn off the MSU should the scanner seize again.

Between April 1995 and December 1996 the SBUV grating drive experienced significant degradation. The grating drive control was reprogrammed to compensate for these problems, as well as for the CCR failure. Other instruments operate satisfactorily. In November 1995, the Demodulator portion of the Command Receiver and Demodulator (CRD) for On-board Processor #1 (OBP1) failed, resulting in the loss of the backup OBP: OBP1 was commanded off. Flight software and ground software packages were modified to permit the use of, and commanding to, only OBP #2.

❖ Operational WXSATS

Once NOAA-L was confirmed operating nominally, it was renamed NOAA-16. Meanwhile, we shall continue to receive transmissions from NOAA-14 on the same frequencies but at different times. NOAA-12 continues nominal image transmissions, unlike NOAA-15 which continues to provide largely unusable imagery on both APT and HRPT frequencies.

Meteor 3-5 continues "resting" during those times when its orbit precesses through periods of low solar illumination. Transmissions from Meteor 2-21 usually replace those from Meteor

3-5 during the latter's off periods. Resurs 01-N4 provides continuous transmissions while in sunlight, and, like the NOAA satellites, is in a sun-synchronous orbit, so transmissions are received during the same time period each day.

❖ The Geostationary scene

The successful launch of GOES-L (now renamed GOES-11) earlier this year has continued the gradual upgrading of weather satellites in geostationary orbit. The geostationary arc encircling the world can be divided into five sections – see figure 4. Satellites from the USA, Eumetsat, Russian Federation, India, Japan and China are listed according to their longitude allocations. With GOES-L (11) already in orbit, and successfully undergoing tests, America remains on course for the future, with the next GOES mission – GOES-M – scheduled for launch in 2001.

Eumetsat's Meteosat Second Generation-1 (MSG-1) was officially scheduled for launch in October 2000, but a recent announcement states that this has been shifted to January 2002 – a significant delay due to ground segment problems, and the non-availability of the Ariane-4 launcher. This is a real disappointment for European WXSAT monitors who have been looking forward to the significant image quality improvements inherent with MSG-1. The new spacecraft will carry a 12-channel imager, including two visible-light channels and seven (!) infrared bands, as well as two near-infrared channels. Interestingly, I notice an acknowledgement that the amount of data produced by the sensors will be so high that it will only be able to downlink half of the 1km visible light data.

The Russian Federation is currently plan-

ning to launch GOMS-N2 in 2001, after delays in the program. India has an Insat communications satellite in orbit over the Indian ocean, and this carries an imaging package. China recently launched Fengyun-2B which is officially undergoing tests, though apparently regular imagery is already available. Finally, Japan has re-scheduled launch of its new Metsat series for 2002.

The retransmission by GOES of imagery from other satellites means that those monitoring GOES can anticipate reliable image flow for the foreseeable future.

Frequencies

NOAA-12 transmits APT on 137.50 MHz
 NOAA-14 and NOAA-16 transmit APT on 137.62 MHz
 NOAA-15 (fault condition) transmits APT on 137.50 MHz
 Meteor 3-5 may transmit APT on 137.30 MHz when in sunlight
 Meteor 2-21 may transmit APT on 137.40 MHz when in sunlight
 Resurs 1-4 transmits APT on 137.85 MHz
 Okean-0, Okean-4 and Sich-1 sometimes transmit APT briefly on 137.40 MHz
 GOES-8 and GOES-10 use 1691 MHz for WEFAX

For purchasing of satellite equipment, check out the ad from Swagur Enterprises on page 105!

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Edited by John Figlio

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See the ad on page 99



World Meteorological Organization

WMO Satellite Activities

Future Geostationary Satellites Coordinated within CGMS
 (as of July 2000)

Sector	Future additional satellites	Operator	Planned launch date	(Planned location) Other remarks
East-Pacific (180°W-108°W)	GOES-M GOES-N GOES-O	USA/NOAA USA/NOAA USA/NOAA	2001 2002 2005	135° W and 75° W
West-Atlantic (108°W-36°W)	GOES-P GOES-Q	USA/NOAA USA/NOAA	2007 2010	
East-Atlantic (36°W-36°E)	MSG-1 MSG-2 MSG-3	EUMETSAT EUMETSAT EUMETSAT	10/2000 04/2002 2006	0° 0° 0°
Indian Ocean (36°E-108°E)	GOMS-N2 INSAT III-A INSAT III-D	Russian Fed India India	2001 2000 2003	76° E
West-Pacific (108°E-180°E)	MTSAT-1R MTSAT-2	Japan Japan	2002 2004	Multi-functional Transport Satellite 140°E

Fig 4: World Meteorological Organization chart of future geostationary satellites – courtesy Donald Hinsman

Federal Freqs in Alaska

Regular Fed File reporter Mark Cobbeldick, KB4CVN, has just returned from Alaska, and passes along some federal frequency information he monitored while in the 49th state.

Denali National Park and Preserve

166.300 [CSQ]/168.2250[100.0 PL]
Main Park Operations and Law Enforcement [Mt. Healy transmitter site for Denali East with another link on 411.650-LVH]
168.350 [CSQ]
Flagmen on road maintenance (I show this as a NIFC channel). [This is a maintenance and operations common user freq-LVH]
411.825 [123.0]
Point-to-point link (same traffic as 166.300 MHz)
151.745[146.2]/Unknown [146.2?]
NPS visitor busses in park (busses operated by ARA?)

Anchorage Area Fed Freqs

412.400 [118.8] Carrier
415.400 [118.8] Carrier
Mark never heard any traffic on either frequency above

Kenai Peninsula

166.375 [?]/Unknown [?]
Unknown user in Seward area (only heard one transmission on frequency, but it was via a repeater). [This is an Alaskan Railroad freq with an input of 171.725-LVH]
172.450 [?]/Unknown [?]
Unknown user (only heard one transmission on frequency, but it was via a repeater). [This is the US Fish and Wildlife Service statewide in Alaska with an input frequency of 169.725, UHF links include 411.625/411.675/417.675-LVH]
168.375 [?]
Unknown (only heard one digital transmission on this frequency) [My best guess is this is an Interior Dept nationwide assignment-LVH]

While on the Kenai Peninsula, Mark searched for possible transmissions from the US Fish and Wildlife Service serving the Kenai National Wildlife Refuge. Mark noted that their vehicles had quarterwave VHF high band whips on them, but he never monitored any confirmed traffic on their known frequencies. The single digital transmission he heard on 168.375 could have been them, using APCO-25 format equipment. The Interior Department has mandated that all new equipment purchases must be APCO-25 format equipment. Mark noted that there are a few exceptions since nobody currently manufactures a narrowband/APCO-25 repeater with a standby current draw of <20mA @ 13.8 VDC that some agencies have requested and need.

Mark also did not monitor any known transmissions from the Chugach National Forest and the

Kenai Fjords National Park. For Mark and the rest of our MT readers here are the notes I have on these two government installations.

Kenai Fjords National Park

166.300/166.900
Park Management, Public Safety, Law Enforcement
166.300/168.225
Park Management, Public Safety, Law Enforcement
166.750/168.575
Park Management, Public Safety, Law Enforcement

Chugach National Forest

169.175/169.825 (136.5 PL)
Fixed Repeater
169.175/169.925 (110.9 PL)
Fixed Repeater
169.175/169.975 (110.9/123.0/131.8/136.5/146.2 PL)
Fixed Repeater
169.175/169.925 (156.7 PL)
Transportable Repeater
169.175/169.975 (156.7/167.9 PL)
Transportable Repeater
411.550/415.550
UHF Link

NASA Communications

Fed File regular Mike Comer passes along below the latest information on the new Kennedy Space Center trunk system. Thanks for the update, Mike.

Control channels: 406.2375 406.4375 406.6375
Voice channels: 406.3750 406.8375 407.0375
407.8375 408.0375 408.4375 408.6375
409.0250 409.6375

System Talk Groups

48 Fire/Rescue 173.5625(?) This assignment is questionable now. Mike can listen to 165.0875 and 48 lights up every time someone talks, then other times 48 comes up with nothing heard on 165.0875. And 48 no longer comes up with 173.5625 at all.
80 Unknown
2768 Unknown
4400 Unknown
4432 Security 173.6875 (this talk group is now quiet, 173.6875 still in use)

While we are on the subject of NASA since we are going to see more and more space shuttle missions thanks to International Space Station, here are some of the latest satellite based frequencies associated with mission communications. Many thanks to Ivan Artner, Joe Blasco, Keith Elgin, John Locker, Jim Kunowsky, Paul Marsh, Ross McCallum, and the SCPC-FDM newsgroup (<http://www.onelist.com/community/scpc-fdm>).

During shuttle missions internet monitors might want to check into IRC-NET channel #satcom for live chats with others listening to shuttle missions and the latest frequencies being used by space shuttle/space station support groups.

Inmarsat Atlantic Ocean Region East (AOR-E) Satellite NASA Nets

1536.025 1537.875 1537.975 1538.875 1540.175 1540.475 1541.125 1541.225

UHF Milsat Nets

261.650 Shuttle Launch Support
261.750 Shuttle Launch Support {Cape Osborne, TAL Ben Guerir, D1W and King 4}

If you are interested in picking up Inmarsat communications, I invite you to contact MT advertiser Swagur Enterprises at 608-592-7409 or <http://www.swagur.com>.

Pisgah National Forest

Thad Osborne from Knoxville recently visited the area of Pineola, North Carolina, which adjoins the Grandfather District of the Pisgah National Forest. He did some extensive monitoring while in the area and passes along the following Forest Service information.

TX1/RX1 168.725 (103.5)/168.725 (CSQ)
Pisgah National Forest Simplex
TX2/RX2 171.475 (103.5)/171.475 (CSQ)
Nantahala National Forest Simplex
TX3/RX3 169.900 (CSQ)/169.900 (CSQ)
Interior Dept TAC?
TX4/RX4 172.225 (136.5)/168.725 (CSQ)
Pisgah National Forest repeater
TX5/RX5 172.225 (103.5)/168.725 (CSQ)
Pisgah National Forest repeater
TX6/RX6 172.225 (146.2)/168.725 (CSQ)
Pisgah National Forest repeater
TX7/RX7 155.160 (186.2)/155.160 (CSQ)
Banner Elk Medcom
TX8/RX8 Blank/162.400 (CSQ)
NOAA WX2
TX9/RX9 173.8125 (CSQ)/168.475 (CSQ)

NIFC "Command 6"
TX10/RX10 168.750 (131.8)/168.750 (CSQ)
Forest Service Fire Net

Thanks to Thad and all our contributors to this edition of the Fed Files column. Now it is time to look at this month's federal spectrum scan. In this issue we continue our detailed look at the reorganized 406-420 MHz UHF federal land mobile service. Happy holidays to all and until next year, 73 and good hunting.

Table One: Federal UHF Land Mobile Service

Frequency	Cy/Paired Freq	Agencies	408.6125	201/417.6125	(No reported activity)	409.3375	259/418.3375	Government Itinerant: wide area, common use repeater output (input 418.3375)/simplex (Nationwide)
408.0000	152/417.0000	Air Force, Army, Bureau of the Mint, Energy Department, Environmental Protection Agency, FAA, FBI, NASA, National Gallery of Art, Navy, Post Office, Treasury Department, US Information Agency, Veterans Administration	408.6250	202/417.6250	Army, Bureau of Indian Affairs, Bureau of Land Management, Fish and Wildlife Service, Geologic Survey, Interior Dept (Nationwide), NASA, National Park Service, Navy, Post Office, TVA	409.3500	260/418.3500	Federal Trunk Group 4 (paired with 417.3500): Air Force, Army, Bureau of Prisons, Coast Guard, Energy Dept, NASA, Navy, Post Office
408.0125	153/417.0125	(No reported activity)	408.6375	203/417.6375	(No reported activity)	409.3625	261/418.3625	(No reported activity)
408.0250	154/417.0250	Air Force, Army, Energy Dept, FAA, Labor Dept, Navy, Post Office, Secret Service, Veterans Administration	408.6500	204/417.6500	Air Force	409.3750	262/418.3750	Air Force, Army, NASA, Energy Dept, Federal Reserve System, Navy, Post Office, Veterans Administration
408.0375	155/417.0375	(No reported activity)	408.6625	205/417.6625	(No reported activity)	409.3875	263/418.3875	(No reported activity)
408.0500	156/417.0500	Air Force, Army, Corps of Engineers, Energy Dept, Health and Human Services, Navy, Post Office, TVA, Veterans Administration	408.6750	206/417.6750	Bureau of Mines (Nationwide), Fish and Wildlife Service (Nationwide), Geologic Survey, Interior Dept (Nationwide), National Park Service (Nationwide)	409.4000	264/418.4000	Air Force, Army, Energy Dept, Library of Congress, Navy, Veterans Administration (Nationwide)
408.0625	157/417.0625	(No reported activity)	408.6875	207/417.6875	(No reported activity)	409.4125	265/418.4125	(No reported activity)
408.0750	158/417.0750	Army, Bureau of Indian Affairs, Bureau of Mines, Bureau of Reclamation, Geologic Survey, Interior Dept (Nationwide), National Park Service, Social Security Administration	408.7000	208/417.7000	Commerce Dept	409.4250	266/418.4250	Air Force, Army, Bureau of Prisons, Energy Dept, NASA, Navy
408.0875	159/417.0875	(No reported activity)	408.7125	209/417.7125	(No reported activity)	409.4375	267/418.4375	(No reported activity)
408.1000	160/417.1000	Air Force, Energy Dept, FBI, Navy, Post Office, State Dept, Veterans Administration	408.7250	210/417.7250	Army, Bureau of Indian Affairs, Bureau of Reclamation, Federal Reserve System, FEMA, Interior Dept (Nationwide), National Park Service	409.4500	268/418.4500	Air Force, Army, Energy Dept, FAA, Federal Reserve System, Navy, Post Office, TVA, Veterans Administration
408.1125	161/417.1125	(No reported activity)	408.7375	211/417.7375	(No reported activity)	409.4625	269/418.4625	(No reported activity)
408.1250	162/417.1250	Air Force, Army (Nationwide), Bureau of Prisons, Energy Dept, Library of Congress, NASA (Nationwide), Navy, Post Office, Veterans Administration	408.7500	212/417.7500	Federal Trunk Group 1 (paired with 417.5500): Air Force, Army, Bureau of Prisons, Energy Dept, NASA, Navy	409.4750	270/418.4750	Army, Energy Dept, FAA, Navy
408.1375	163/417.1375	(No reported activity)	408.7625	213/417.7625	(No reported activity)	409.4875	271/418.4875	FAA
408.1500	164/417.1500	Federal Trunk Group 3 (paired with 416.9500): Air Force, Army, Bureau of Prisons, Energy Dept, FAA, NASA (Nationwide), Navy, Post Office, Veterans Administration	408.7750	214/417.7750	(No reported activity)	409.5000	272/418.5000	Army, Energy Dept, FBI, HUD, Navy
408.1625	165/417.1625	(No reported activity)	408.7875	215/417.7875	Army, Bureau of Indian Affairs, Bureau of Land Management, Energy Dept, FEMA, Interior Dept (Nationwide), National Park Service	409.5125	273/418.5125	(No reported activity)
408.1750	166/417.1750	Air Force, Army, Bureau of the Mint, Energy Dept, FAA, FBI, GSA, Navy, Post Office, Veterans Administration	408.8000	216/417.8000	(No reported activity)	409.5250	274/418.5250	Air Force, Army, Bureau of Reclamation, Energy Dept, Federal Reserve System, NASA, Post Office
408.1875	167/417.1875	(No reported activity)	408.8125	217/417.8125	(No reported activity)	409.5375	275/418.5375	(No reported activity)
408.2000	168/417.2000	Air Force, Energy Dept, NASA, Navy, TVA, Veterans Administration	408.8250	218/417.8250	Energy Dept, FAA (Nationwide), Post Office	409.5500	276/418.5500	Federal Trunk Group 1 (paired with 418.3500): Air Force, Army, Bureau of Prisons, FAA, NASA, National Park Service, Navy, Post Office
408.2125	169/417.2125	(No reported activity)	408.8375	219/417.8375	(No reported activity)	409.5625	277/418.5625	(No reported activity)
408.2250	170/417.2250	Bureau of Prisons, FBI, Immigration and Naturalization Service (Nationwide)	408.8500	220/417.8500	WHCA (Nationwide)	409.5750	278/418.5750	Army, Energy Dept, FAA, Interior Dept
408.2375	171/417.2375	FBI	408.8625	221/417.8625	(No reported activity)	409.5875	279/418.5875	(No reported activity)
408.2500	172/417.2500	FAA, FBI, Immigration and Naturalization Service (Nationwide), Justice Dept, Navy	408.8750	222/417.8750	WHCA (Nationwide)	409.6000	280/418.6000	Army, Energy Dept, FAA, Forest Service, House of Representatives, Navy
408.2625	173/417.2625	(No reported activity)	408.8875	223/417.8875	(No reported activity)	409.6125	281/418.6125	(No reported activity)
408.2750	174/417.2750	DEA, Immigration and Naturalization Service (Nationwide)	408.9000	224/417.9000	Commerce Dept	409.6250	282/418.6250	State Department (Nationwide)
408.2875	175/417.2875	(No reported activity)	408.9125	225/417.9125	(No reported activity)	409.6375	283/418.6375	(No reported activity)
408.3000	176/417.3000	Bureau of Prisons, DEA, FBI, Immigration and Naturalization Service (Nationwide), Justice Dept, Navy	408.9250	226/417.9250	WHCA (Nationwide)	409.6500	284/418.6500	Air Force, Army, Forest Service, NASA, National Park Service, Navy, Post Office, Veterans Administration
408.3125	177/417.3125	(No reported activity)	408.9375	227/417.9375	(No reported activity)	409.6625	285/418.6625	(No reported activity)
408.3250	178/417.3250	FBI, Immigration and Naturalization Service (Nationwide)	408.9500	228/417.9500	Air Force, Army, Bureau of Prisons, Energy Dept, NASA, Navy	409.6750	286/418.6750	Hydrologic Channel (center frequency): US Government/Non-Government Agencies (12.5 kHz or greater simplex only) [authorized for use until December 31, 2007]
408.3375	179/417.3375	(No reported activity)	408.9625	229/417.9625	(No reported activity)	409.6875	287/418.6875	(No reported activity)
408.3500	180/417.3500	Federal Trunk Group 2 (paired with 416.3500): Air Force, Army, Bureau of Prisons, Energy Dept, Immigration and Naturalization Service (Nationwide), NASA, Navy	408.9687	230/417.9687	Low power, non-voice 5 kHz bandwidth splinter frequency (408.965625) [until December 31, 2004]	409.7000	288/418.7000	Air Force, Navy, State Dept, Treasury Dept
408.3625	181/417.3625	(No reported activity)	408.9718	231/417.9718	Low power, non-voice 5-10 kHz bandwidth splinter frequency (408.968750) [until December 31, 2004]	409.7125	289/418.7125	(No reported activity)
408.3750	182/417.3750	DEA, Immigration and Naturalization Service (Nationwide)	408.9781	232/417.9781	Low power, non-voice 5 kHz bandwidth splinter frequency (408.971875) [until December 31, 2004]	409.7250	290/418.7250	Hydrologic Channel (center frequency): US Government/Non-Government Agencies (12.5 kHz or greater simplex only) [authorized for use until December 31, 2007]
408.3875	183/417.3875	(No reported activity)	408.9812	233/417.9812	Low power, non-voice 5-10 kHz bandwidth splinter frequency (408.978125) [until December 31, 2004]	409.7375	291/418.7375	(No reported activity)
408.4000	184/417.4000	US Government (all agencies) common use frequency [until December 31, 2004]	408.9843	234/418.0250	Low power, non-voice 5 kHz bandwidth splinter frequency (408.984375) [until December 31, 2004]	409.7500	292/418.7500	Federal Trunk Group 3 (paired with 418.5500): Air Force, Army, Bureau of Prisons, Energy Dept, NASA, National Park Service, Navy
408.4125	185/417.4125	(No reported activity)	408.9875	235/418.0375	(No reported activity)	409.7625	293/418.7625	(No reported activity)
408.4250	186/417.4250	Air Force, Army, Bureau of Land Management, Bureau of Reclamation, Energy Dept, FAA, Interior Dept (Nationwide), NASA, National Park Service, Navy, Post Office, TVA, Veterans Administration	409.0000	236/418.0500	Army, Coast Guard (Nationwide), Food and Drug Administration, HHS (Nationwide), Indian Health Service, Navy	409.7750	294/418.7750	Air Force, Army, Energy Dept, FBI, Navy, Post Office, Smithsonian Institution, Treasury Dept, Veterans Administration
408.4375	187/417.4375	(No reported activity)	409.0125	237/418.0625	(No reported activity)	409.7875	295/418.7875	(No reported activity)
408.4500	188/417.4500	Air Force, Commerce Dept	409.0250	238/418.0750	Air Force, Army, Energy Dept, FAA, Federal Reserve System, Food and Drug Administration, Labor Dept, NASA, Navy, Post Office, State Dept, Treasury Dept, Veterans Administration	409.8000	296/418.8000	Army, Energy Dept, FAA, Navy
408.4625	189/417.4625	(No reported activity)	409.0375	239/418.0875	(No reported activity)	409.8125	297/418.8125	(No reported activity)
408.4750	190/417.4750	Army, Bureau of Indian Affairs, Bureau of Land Management, FAA, Interior Dept (nationwide), Labor Dept, National Park Service, Navy, Post Office	409.0500	240/418.1000	(No reported activity)	409.8250	298/418.8250	Air Force, Army, Coast Guard, Energy Dept, FAA, GSA, National Science Foundation, Navy, Post Office
408.4875	191/417.4875	(No reported activity)	409.0625	241/418.1125	(No reported activity)	409.8375	299/418.8375	(No reported activity)
408.4906	192/417.4906	Low power, non-voice 5 kHz bandwidth splinter frequency (408.490625) [until December 31, 2004]	409.0750	242/418.1250	Government Itinerant: local area, common use repeater output (input 418.075)/simplex (Nationwide)	409.8500	300/418.8500	Air Force, Army, Energy Dept, FAA, National Park Service, Navy
408.4937	193/417.4937	Low power, non-voice 5-10 kHz bandwidth splinter frequency (408.493750) [until December 31, 2004]	409.0875	243/418.1375	(No reported activity)	409.8625	301/418.8625	(No reported activity)
408.4968	194/417.4968	Low power, non-voice 5 kHz bandwidth splinter frequency (408.496875) [until December 31, 2004]	409.1000	244/418.1500	(No reported activity)	409.8687	302/418.8687	Low power, non-voice 5 kHz bandwidth splinter frequency (409.865625) [until December 31, 2004]
408.5000	195/417.5000	Secret Service (nationwide)	409.1125	245/418.1625	(No reported activity)	409.8718	303/418.8718	Low power, non-voice 5-10 kHz bandwidth splinter frequency (409.868750) [until December 31, 2004]
408.5031	196/417.5031	Low power, non-voice 5 kHz bandwidth splinter frequency (408.503125) [until December 31, 2004]	409.1250	246/418.1750	Army, Energy Dept, FAA, House of Representatives (Nationwide), Navy, Office of Technological Assessment, Post Office, US Information Agency	409.8781	304/418.8781	Low power, non-voice 5 kHz bandwidth splinter frequency (409.871875) [until December 31, 2004]
408.5062	197/417.5062	Low power, non-voice 5-10 kHz bandwidth splinter frequency (408.506250) [until December 31, 2004]	409.1375	247/418.1875	(No reported activity)	409.8875	305/418.8875	(No reported activity)
408.5093	198/417.5093	Low power, non-voice 5 kHz bandwidth splinter frequency (408.509375) [until December 31, 2004]	409.1500	248/418.2000	Air Force, Architect of the Capitol, Army, Energy Dept, FAA, NASA, Navy, Post Office	409.9000	306/418.9000	Air Force, Army, Energy Dept, NASA, Navy, Post Office, Veterans Administration
408.5125	199/417.5125	(No reported activity)	409.1625	249/418.2125	Coast Guard	409.9125	307/418.9125	(No reported activity)
408.5250	200/417.5250	Army, Bureau of Indian Affairs, Bureau of Land Affairs, Bureau of Reclamation, Energy Dept, FAA, Fish and Wildlife Service, Interior Dept (Nationwide), Marshal Service, National Park Service, Navy, Post Office	409.1750	250/418.2250	Air Force, Army, Coast Guard, Energy Dept, EPA, FAA, GAO, ICC, National Science Foundation, NASA, Navy, Post Office	409.9250	308/418.9250	Air Force, Army, Environmental Research Lab, National Ocean Service, National Weather Service, Navy
408.5375	201/417.5375	(No reported activity)	409.1875	251/418.2375	US Information Agency	409.9375	309/418.9375	(No reported activity)
408.5500	202/417.5500	Federal Trunk Group 4 (paired with 416.5500): Air Force, Army, Bureau of Mines, Bureau of Prisons, Bureau of Reclamations, Energy Dept, NASA, Navy	409.2000	252/418.2500	Air Force, Army, Energy Dept, Federal Reserve System, Forest Service, NASA, Navy, Post Office, Veterans Administration	409.9500	310/418.9500	Federal Trunk Group 2 (paired with 417.9500): Air Force, Army, Bureau of Prisons, Commerce Dept, Energy Dept, Environmental Research Lab, NASA, National Bureau of Standards, National Weather Service, Navy
408.5625	203/417.5625	(No reported activity)	409.2125	253/418.2625	(No reported activity)	409.9625	311/418.9625	(No reported activity)
408.5750	204/417.5750	Air Force, Army, Bureau of Land Management, Bureau of Reclamation, Interior Dept (Nationwide), Labor Dept, National Park Service, Navy, Post Office, TVA	409.2250	254/418.2750	Air Force, Army, Bureau of Prisons, Energy Dept, Navy, Post Office (Nationwide)	409.9750	312/418.9750	Air Force, Energy Dept, Environmental Research Lab, FAA, Labor Dept, National Bureau of Standards, TVA
408.5875	205/417.5875	(No reported activity)	409.2375	255/418.2875	(No reported activity)	409.9875	313/418.9875	Interagency Low Enforcement UHF Interoperability Channel <Inop 1> -> (Paired with 418.9875-167.9 Hz PL-NAC S68F) and UHF Interoperability Channel <Inop 7> -> (Simplex -167.9 Hz PL-NAC S68F)
408.6000	206/417.6000	NASA, Nuclear Regulatory Commission (Nationwide), State Dept (Nationwide)	409.2500	256/418.3000	Air Force, Army, Energy Dept, FAA, Labor Dept, Navy, Post Office, TVA, Veterans Administration			
			409.2625	257/418.3125	(No reported activity)			
			409.2750	258/418.3250	Air Force, Army, Energy Dept, Veterans Administration (Nationwide)			

Who's on Where?

First-time scanner listeners are often confused about where to find trunked radio frequencies. Internet newsgroups and websites are often good sources of information, but what if you're interested in a system that no one else is talking about?

This month we'll go over where to look for frequency information and how trunking frequencies are assigned. We'll also take a look at some new frequencies that are on the horizon.

❖ FCC Rules

In the United States, the Federal Communications Commission (FCC) is the governmental authority that assigns specific radio frequencies to individual users. These assignments are made in accordance with a set of rules, also issued by the FCC, that are published in the *Code of Federal Regulations*. The CFR is divided into sections called Titles, and Title 47 (Telecommunication) is of interest to scanner listeners.

Within Title 47 are a number of Parts. Most people who read the label on the back of electronic devices may have read something like

This device complies with Part 15 of the FCC Rules.

Part 15 is subtitled "Radio Frequency Devices" and contains a lot of rules regarding how an electronic device should (and should not) operate. This also happens to be the section that prohibits the manufacture of scanners capable of receiving cellular telephone frequencies, and requires that scanners have a permanent label reading:

WARNING: MODIFICATION OF THIS DEVICE TO RECEIVE CELLULAR RADIOTELEPHONE SERVICE SIGNALS IS PROHIBITED UNDER FCC RULES AND FEDERAL LAW.

❖ Land Mobile Radio

Part 90 of Title 47, subtitled "Private Land Mobile Radio Services," lists the rules pertaining to the operation of (you guessed it) land mobile radio. In this Part you'll find the various band plans and allowed modes of operation for both conventional and trunked radio systems, buried within the typical regulatory jargon.

At present there are three common areas where trunked radio operates, namely VHF High Band, UHF, and 800 MHz.

VHF stands for Very High Frequency and refers to a portion of the radio spectrum between

30 MHz and 300 MHz. It is divided into "bands," named low, mid, and high. VHF low band covers the range of 30 MHz to 50 MHz. VHF mid-band runs from 72 MHz to 76 MHz, and VHF high band is from 108 MHz to 174 MHz. Most trunking systems in VHF operate at the top of the high band between 150 MHz and 174 MHz.

UHF stands for Ultra High Frequency and refers to a portion of the radio spectrum between 300 MHz and 3,000 MHz (3,000 MHz is the same as 3 GHz). Most trunking systems that are called UHF operate between 450 MHz and 512 MHz. Confusingly, 800 MHz falls within the UHF portion of the spectrum, but most people prefer to talk about 800 MHz as separate from UHF.

❖ FCC defines Trunking

Although there are many technical differences between trunking systems, the FCC has historically recognized only two types. *Centralized* trunked systems use a control channel to transmit channel information to mobile units. Motorola and EDACS are both centralized systems. Radios in a *decentralized* trunked system listen to each channel in order to find one that is available for use. Logic Trunked Radio (LTR) is a type of decentralized system.

In the view of the FCC, centralized systems run the risk of causing "harmful interference," because the radio doesn't listen to a voice channel before transmitting. The control channel tells the radio which frequency to use without regard for any other users that might be nearby. Since decentralized systems search for a quiet channel before transmitting, the risk of interfering with another user or system is minimized. Because of this risk, the FCC has not usually authorized centralized trunked systems in shared frequency bands below 800 MHz.

❖ 150 to 174 MHz

Public safety agencies in VHF typically operate between 150 MHz and 174 MHz. These are usually older, non-trunked (so-called conventional) systems that are often very congested. The radio propagation characteristics of VHF allow good coverage with relatively few towers, so it's an economical solution.

This is a very crowded area of the spectrum, with a wide variety of government and commercial users. You may find a limited amount of trunking activity here, but most of the radio systems are conventional.

For some uses in this band, frequencies may

be assigned in pairs with a separation of 5.26 MHz. In this band channels are typically assigned every 15 kHz, so try searching in 5 kHz steps with a bandwidth of either 12.5 kHz or 25 kHz.

❖ 450 - 470 MHz

This UHF segment is also very crowded, with a lot of land mobile activity. UHF tends to have somewhat less range than VHF, but works better in urban areas. Along with a large number of older public safety trunked systems, you'll find municipal and utility repair crews and even a dogcatcher ("animal control") or two.

In this band frequencies are generally assigned as a pair, with the base station transmitting 5 MHz lower than the mobile unit. For example, an electric repair crew using mobile radios transmitting on 456.025 MHz would have a corresponding base station radio transmitting on 451.025 MHz.

Between 460 MHz and 470 MHz in particular you should find police and fire activity. Mobile units transmit between 465 MHz and 470 MHz in 25 kHz steps, while the corresponding base transmits between 460 MHz and 465 MHz. Low power, 2-watt handheld radios may operate in 12.5 kHz steps.

Scanner listeners should use a step size of 12.5 kHz and a bandwidth of 25 kHz.

❖ 470 to 512 MHz

The frequency spectrum between 470 MHz and 512 MHz was originally assigned to television stations operating on channels 14 through 20. New frequencies in this range are only available in 11 cities (Boston, Chicago, Dallas, Houston, Los Angeles, Miami, New York, Philadelphia, Pittsburgh, San Francisco, and Washington, DC). In Los Angeles, these frequencies are limited for use only by Public Safety agencies.

In this band frequencies are usually assigned in pairs, with the mobile unit transmitting 3 MHz higher than the base station. An example would be a mobile transmitting on 485.00625 MHz and the corresponding base station transmitting on 482.00625 MHz.

Assignable frequencies occur in 6.25 kHz increments with a bandwidth of 25 kHz.

❖ 800 MHz

The 800 MHz segment contains the majority of trunked radio frequencies monitored by scanner listeners. Public safety activity occurs

in two bands, 806 MHz to 824 MHz and 851 MHz to 869 MHz. According to FCC rules, current production scanners must block the cellular telephone frequencies that reside between these two bands.

Public safety and private systems are mixed in this band. Radio propagation for 800 MHz is good for in-building coverage, but requires more tower sites than VHF or UHF systems and thus is more expensive for an agency to install and maintain.

You can think of the 800 MHz as divided into two sections. The block between 806 MHz and 851 MHz are where mobiles transmit, and between 851 MHz and 896 MHz are where the corresponding base station transmits. Mobiles transmit exactly 45 MHz higher than base stations, but most scanner listeners are not close enough to the mobiles to capture the signal.

Spacing is either 12.5 kHz or 25 kHz with a bandwidth of 25 kHz.

Table 1 indicates the general allocations for trunked systems:

Table 1: Trunked System Allocations - 800MHz			
Base	Mobile	Step Size	Assignment
856.0125 to 860.9875	811.0125 to 815.9875	25	General
861.0125 to 865.9875	816.0125 to 820.9875	25	Specialized Mobile
866.0125 to 868.9875	821.0125 to 823.9875	12.5	Public Safety

❖ Other Areas

There are a few other areas of the spectrum where you may come across trunked radio systems. These are less popular than the bands already mentioned, but are worth checking in your local area. If you hear trunked activity in these bands, please send me an e-mail and let me know what you find!

❖ 220 to 222 MHz

This band is shared with automatic vehicle location (AVL) telemetry data.

Base units transmit between 220.0025 MHz and 220.9975 MHz in 5 kHz steps. Mobile units transmit back exactly 1 MHz higher.

❖ 935 to 941 MHz

A number of private trunked systems operate between 935 MHz and 941 MHz, although it is not uncommon for public safety agencies to make use of these private systems.

Frequencies are assigned in 12.5 kHz steps.

❖ Future Frequencies

As a popular scanner manufacturer states, "the future is wireless." With the explosion of wireless services comes the need for addition radio spectrum. To ease overcrowding and make some money for the U.S. Treasury, Congress has

mandated that the FCC auction off additional bands that can be used for new services.

Broadcast television stations use up a lot of radio spectrum. A single UHF TV channel takes up 6 MHz, a block that could hold more than 200 voice radio channels. You may recall that the entire cellular telephone industry started in a portion of the radio spectrum left vacant when the FCC eliminated UHF TV channels 70 through 83 decades ago.

Under current FCC regulations, broadcasters on TV channels 60 through 69 must move to new frequencies more suitable for high-definition digital television by 2006. Out of these 10 channels, the FCC has set aside 24 MHz specifically for public safety. This represents the largest single allocation of spectrum for public safety ever made, and doubles current allocations.

❖ 700 MHz

Specifically, the plan allocates 764 MHz to 776 MHz (TV channels 63 and 64) for base-to-mobile transmissions and 794 MHz to 806 MHz (TV channels 68 and 69) for mobile-to-base. This should make it easier for equipment manufacturers to build 700 MHz-capable mobile radios, since the existing 800 MHz mobile frequencies begin at 806 MHz.

The FCC established two basic types of channels, a narrowband channel of 6.25 kHz and a wideband channel of 50 kHz. The FCC is betting technology will improve to the point where voice radio equipment can make use of channels only 6.25 kHz wide. The FCC calls this "spectrum efficiency," and it means more users will be packed into smaller channels without interfering with each other. Until technology catches up, users are expected to aggregate four of these slivers into larger 25 kHz channels that current generation equipment requires.

Any 700 MHz system that uses six or more narrowband channels must be trunked, although the FCC doesn't specify a standard. In addition, all radios must use digital modulation, and the FCC recommends the Project 25 Phase I voice standard (sometimes called APCO 25 – see the June, 2000 *Tracking the Trunks* column for more information) be used. Mobile transmitters may have analog capability, but they will either be

low power (2 watts or less) or be a secondary mode to the primary digital mode.

Radios that use the wideband channels will be required to move data very rapidly, up to 384 kilobits per second (kbps) in 150 kHz. The FCC anticipates public safety users will be transmitting video images and data across these frequencies, providing a real-time "on-scene" information to dispatch centers and other mobile users.

It will take several years for the 700 MHz band to start carrying public safety traffic, so there's no hurry to find a scanner to cover 700 MHz. The biggest hurdle for public safety agencies is to get the current users of the spectrum (what the FCC calls "incumbents") to leave before 2006. There are nearly 100 broadcast TV stations and more than 1,300 low power and translator TV stations licensed to operate on channels 60 to 69, and they're not in any hurry to leave.

That's all for this month. More information is available on my website at <http://www.signalharbor.com>, and I am reachable via electronic mail at dan@signalharbor.com. Until next month, happy monitoring!



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Highway Maintenance

In keeping with this month's roadtrip down I-35, *Service Search* column will be taking an in-depth look at the new highway maintenance service frequency allocations currently being licensed by the Federal Communications Commission. Scanner listeners should be listening for newly allocated splinter channels (VHF 7.5 kHz/UHF 6.25 kHz) to become active in their areas.

With the increased inclement winter weather we are now experiencing, these highway maintenance allocations can be exciting frequencies to monitor road construction/snow removal operations.

33.02	Base or mobile	One-way paging on secondary basis
33.06	Base or mobile	One-way paging on secondary basis
33.10	Base or mobile	One-way paging on secondary basis
37.90	Base or mobile	
37.92	Base or mobile	
37.94	Base or mobile	
37.96	Base or mobile	
37.98	Base or mobile	
45.68	Base or mobile	
45.72	Base or mobile	
45.76	Base or mobile	
45.80	Base or mobile	
45.84	Base or mobile	
47.02	Base or mobile	State/Local only secondary basis to work with state
47.04	Base or mobile	State/Local only secondary basis to work with state
47.06	Base or mobile	State/Local only secondary basis to work with state
47.08	Base or mobile	State/Local only secondary basis to work with state
47.10	Base or mobile	State/Local only secondary basis to work with state
47.12	Base or mobile	State/Local only secondary basis to work with state
47.14	Base or mobile	State/Local only secondary basis to work with state
47.16	Base or mobile	State/Local only secondary basis to work with state
47.18	Base or mobile	State/Local only secondary basis to work with state
47.20	Base or mobile	State/Local only secondary basis to work with state
47.22	Base or mobile	State/Local only secondary basis to work with state
47.24	Base or mobile	State/Local only secondary basis to work with state
47.26	Base or mobile	State/Local only secondary basis to work with state
47.28	Base or mobile	State/Local only secondary basis to work with state
47.30	Base or mobile	State/Local only secondary basis to work with state
47.32	Base or mobile	State/Local only secondary basis to work with state

47.34	Base or mobile	State/Local only secondary basis to work with state	156.240	Base or mobile	Assignment for licensees other than the state
47.36	Base or mobile	State/Local only secondary basis to work with state	156.2475	Base or mobile	Assignment for licensees other than the state/Bandwidth not to exceed 11.25 kHz
47.38	Base or mobile	State/Local only secondary basis to work with state	158.985	Mobile	Assignment for licensees other than the state
47.40	Base or mobile	State/Local only secondary basis to work with state	158.9925	Mobile	Assignment for licensees other than the state/Bandwidth not to exceed 11.25 kHz
150.995	Base or mobile		159.000	Mobile	Assignment for licensees other than the state
151.0025	Base or mobile	Bandwidth not to exceed 11.25 kHz	159.0075	Mobile	Assignment for licensees other than the state/Bandwidth not to exceed 11.25 kHz
151.010	Base or mobile		159.015	Mobile	Assignment for licensees other than the state
151.0175	Base or mobile	Bandwidth not to exceed 11.25 kHz	159.0225	Mobile	Assignment for licensees other than the state/Bandwidth not to exceed 11.25 kHz
151.025	Base or mobile		159.045	Mobile	Assignment for licensees other than the state
151.0325	Base or mobile	Bandwidth not to exceed 11.25 kHz	159.0525	Mobile	Assignment for licensees other than the state/Bandwidth not to exceed 11.25 kHz
151.040	Base or mobile		159.060	Mobile	Assignment for licensees other than the state
151.0475	Base or mobile	Bandwidth not to exceed 11.25 kHz	159.0675	Mobile	Assignment for licensees other than the state/Bandwidth not to exceed 11.25 kHz
151.055	Base or mobile		159.075	Mobile	Assignment for licensees other than the state
151.070	Base or mobile	25 kHz bandwidth authorized	159.0825	Mobile	Assignment for licensees other than the state/Bandwidth not to exceed 11.25 kHz
151.085	Base or mobile		159.105	Mobile	Assignment for licensees other than the state
151.0925	Base or mobile	Bandwidth not to exceed 11.25 kHz	159.1125	Mobile	Assignment for licensees other than the state/Bandwidth not to exceed 11.25 kHz
151.100	Base or mobile		159.120	Mobile	Assignment for licensees other than the state
151.1075	Base or mobile	Bandwidth not to exceed 11.25 kHz	159.1275	Mobile	Assignment for licensees other than the state/Bandwidth not to exceed 11.25 kHz
151.115	Base or mobile		159.135	Mobile	Assignment for licensees other than the state
151.1225	Base or mobile	Bandwidth not to exceed 11.25 kHz	159.1425	Mobile	Assignment for licensees other than the state/Bandwidth not to exceed 11.25 kHz
151.130	Base or mobile		159.165	Base or mobile	Assignment for licensees other than the state
151.1375	Base or mobile	Bandwidth not to exceed 11.25 kHz	159.1725	Base or mobile	Assignment for licensees other than the state/Bandwidth not to exceed 11.25 kHz
156.045	Mobile		156.180	Base or mobile	Assignment for licensees other than the state
156.0525	Mobile	Bandwidth not to exceed 11.25 kHz	156.1875	Base or mobile	Assignment for licensees other than the state/Bandwidth not to exceed 11.25 kHz
156.060	Mobile		156.195	Base or mobile	Assignment for licensees other than the state
156.0675	Mobile	Bandwidth not to exceed 11.25 kHz	156.2025	Base or mobile	Assignment for licensees other than the state/Bandwidth not to exceed 11.25 kHz
156.075	Mobile		156.225	Base or mobile	Assignment for licensees other than the state
156.0825	Mobile	Bandwidth not to exceed 11.25 kHz	156.2325	Base or mobile	Assignment for licensees other than the state/Bandwidth not to exceed 11.25 kHz
156.105	Base or mobile				
156.1125	Base or mobile	Bandwidth not to exceed 11.25 kHz			
156.120	Base or mobile				
156.1275	Base or mobile	Bandwidth not to exceed 11.25 kHz			
156.135	Base or mobile				
156.1425	Base or mobile	Bandwidth not to exceed 11.25 kHz			
156.165	Base or mobile	Assignment for licensees other than the state			
156.1725	Base or mobile	Assignment for licensees other than the state/Bandwidth not to exceed 11.25 kHz			
156.180	Base or mobile	Assignment for licensees other than the state			
156.1875	Base or mobile	Assignment for licensees other than the state/Bandwidth not to exceed 11.25 kHz			
156.195	Base or mobile	Assignment for licensees other than the state			
156.2025	Base or mobile	Assignment for licensees other than the state/Bandwidth not to exceed 11.25 kHz			
156.225	Base or mobile	Assignment for licensees other than the state			
156.2325	Base or mobile	Assignment for licensees other than the state/Bandwidth not to exceed 11.25 kHz			
			159.180	Base or mobile	Bandwidth not to exceed 11.25 kHz
			159.1875	Base or mobile	
			159.195	Base or mobile	
			159.2025	Base or mobile	Bandwidth not to exceed 11.25 kHz

Welcome aboard, everyone, and fasten your seatbelts. Our first stop is SeaTac (Seattle-Tacoma Washington International Airport), then on to Boeing Field (King County International), and then to Portland (Oregon) International. Also, we will examine the latest ARINC MWARA HF frequencies, contributed by Ron Perron. And lastly, thanks to the FAA we have a peek at Weather Processors utilized by ATC. Looks as if we have a busy day, so let's get started!

SEATTLE -TACOMA INTERNATIONAL:

SEA Location—N 47° 26.28', W 122° 18.67' (Attended 24 Hrs)	
ATIS -	118.000
Tower -	119.900
Ground -	121.700
APP/DEP Sector:	
076 - 160°	Runway 16 119.200
341 - 075°	119.200
199 - 300°	120.100
301 - 340°	Runway 34 120.400
076 - 160°	Runway 34 125.900
301 - 340°	Runway 16 125.900
161 - 198°	126.500
ILS	Runway 34R 10.300 SEA
NDB (LOM)	4.4 nm-337° to Field 224.000
ILS/DME	Runway 16R/34L 111.700 SZI
NDB (LOM)	5.7 nm - 160° to field 281 SZ
CL DEL*	IFR & VFR Pre-Taxi Clearance Required - 128.000
VOR/DME	At Field 116.800 SEA
FSS	Seattle FSS 122.500 - 123.650
UNICOM	Signature Flight Support 122.950

SEATTLE BOEING FIELD:

Location-N 47° 31.80', W 122° 18.67' BFI	
ATIS	127.750
Tower	Short Runway (309°-127°) 118.300
Tower	Long Runway (128°-308°) 120.600
IFR	Non Jet Departure 126.400
Ground	121.900
App/Dep	
NDB (LOM)	See SEA-TAC above
NDB (LOM)	7.1 nm-128° to Field 362 BF
NDB (LOM)	At Field 281 SZ
VOT	Transmitter on top of Tower 108.600
CL DEL*	118.900
VOR/DME	5.7 nm-341° to Field 116.800 SEA
ILS/DME	Runway 13R 110.900 BFI
FSS	Seattle FSS 122.500-123.650
UNICOM	Galvin Flying Service 122.950
UNICOM	Flite Center 122.950
UNICOM	Aero Flight 122.950

*CL DEL - Clearance Delivery

PORTLAND International (PDX)

Location-N 45° 35.32' W 122° 35.85' (Attended 24 Hrs)	
ATIS	128.350
Tower	118.700
Ground	121.900
CL DEL	120.125
App/Dep Sector 100-279°	118.100
App/Dep Sector 280-099°	133.000
ILS	Runway 10R 109.900 PDX
ILS	Runway 28R 111.300 IAP
ILS/DME Runway 20 - Localizer Only	108.900 GPO
NDB (LOM)	6.4 nm - 277° 332 IA
VOT	Xmtr located Appch End Rwy 10 111.000
VOR/DME	9.6 nm - 161° 116.600
VOR/DME	At Field 111.800 PDX
UNICOM Flightcraft	122.950

ARINC HF Frequencies

Thanks to Ron for contributing the following ARINC HF Frequencies; these also show new freqs for the Atlantic (NAT) HF Sectors. The

North Atlantic sectors were featured in the August issue.

SEA-1	SEA-2	SEA-3 (SEA_South East Asia)
2872	6655	3485
2923	8861	5655
2947	8906	6589
3467	8909	8942
3470	8948	11396
3491	8960	10042
5484	10018	17907
5580	10066	
5601	11285	
5658	11396	
5670	13288	
6556	17907	
6583		

EA - East Asia				
3016	6571	8897	10042	17958

NCA - North Central Asia				
NCA-1	NCA-2	NCA-3		
3422	3046	2868	3461	5557
4672	4712	3046	4465	5568
5596	4728	3102	4728	5715
11390	6704	3425	5505	6589
				7870

CWP - Central West Pacific				
CWP				
2998	4666	6571	8897	13300
3016	5565	6622	8903	17904
3419	6425	6665	10081	21985
3425	6532	8837	11384	
3455	6562	8861	11393	

CEP - Central East Pacific				
CEP-1	CEP-2			
3413	8843		2869	
3452	10057		5547	
5574	13354		11282	
6673			13288	

SP - South Pacific				
3425	4693	6649	13261	
3461	5643	8858	13300	
3467	6553	8867	13354	
4469	6580	11339	17904	

NP - North Pacific				
2932	6571	10048	17904	
3016	6655	11330	17946	
5628	8897	13273	21925	
5667	8915	13339		

SAT (South Atlantic) 1&2				
2854	5526	6673	13297	
3023	5540	8825	13315	
3452	5565	8861	13357	
5440	6535	11291	17955	

SAM-1 (South America)	SAM-2			
2944	2887	6577		
4469	2910	6649		
5454	2944	6730.5		
5583	3023	8825		
5604	3479	8855		
5643	3488	8894		
6649	4669	8918		
8667	5440	10024		
10024	5526	10096		
11360	5540	11291		
11397	5556	11360		
13261	5595	11387		
13300	6535	13297		
17907	6553	17907		

CAR-A (Caribbean)	CAR-B			
2887	2887			
2910	2910			
3455	3023			
5440	3455			

5520	5440
5526	5520
5550	5526
6577	5540
6586	6577
8825	6586
8846	8825
8855	8846
8918	8855
10096	8918
11387	10096
11396	11291
13297	11330
17907	11387
	17907

Remember, many frequencies may be allocated to an area, but not all are utilized. This list will be continued next month

Weather Processors Products Team (ATC-Related)

Integrated Terminal Weather System (ITWS) – ITWS is an automated weather system that provides near term (0 - 30 min.) prediction of significant terminal area weather. ITWS integrates data from radars, sensors, and automated aircraft reports. It generates products including windshear and predictions, storm cell and lightning information, and terminal area winds aloft.

Weather and Radar Processor (WARP) – WARP is an integrated, end-to-end system that receives and processes real time weather data from multiple sources, and produces displays of weather information for multiple users to support the en route environment. The primary products are NEXRAD radar data. WARP will replace existing meteorologist weather processor (MWP) systems currently in ARTCCs and the Air Traffic Control System Command Center.

Meteorologist Weather Processor (MWP) – MWPs are located at the 21 ARTCCs within the Center Weather Service Units (CWSU) and two are at the Air Traffic Control System Command Center for its Weather Service Unit. The MWP provides the processing tools to consolidate weather data from multiple sources into one database. Sources are the Geostationary Operational Environmental Satellites, NWS family of services, and NWS and FAA radars. The meteorologist uses the MWP's processed data to provide weather updates and forecasts for air traffic personnel.

Weather Message Switching Center Replacement (WMSCR) – The WMSCR's primary purpose is to collect and process weather data for distribution within the NAS. The WMSCR will also collect, distribute, and store NOTAM (notice to air men) data. The single Weather Message Switching Center located in Kansas City will be replaced with identical WMSCR nodes in the National Aviation Weather Processors facilities at Atlanta, Georgia and Salt Lake City, Utah.

Aviation Weather Research (AWR) – The goal of AWR is to increase the scientific understanding of atmospheric processes that cause the development of hazardous weather, which in turn, impacts aviation. The research is aimed toward generating weather observations, warnings, and forecasts that are more accurate and more accessible.

Merry Christmas, Happy Hannukah, and a very Happy New Year to all; 73, and out.

New AM stations?

During a five-day period in late January, the FCC accepted proposals for new AM stations or major technical changes to existing stations. Many of the proposals were mutually exclusive – that is, granting one would make it impossible to grant one or more others without generating interference. These conflicts will be resolved by auction. However, 90 of the new-station proposals were not exclusive. These applicants have been permitted to file formal applications; presumably If the paperwork is filed properly and fees paid, the new stations and changes will be granted. Table 1 shows the communities and frequencies involved.

You should not assume that all of these stations will actually appear on the air. New AM stations seem to have a rather poor record of actually being built. The ones that do get built will face zoning problems when they try to construct their antennas. Don't expect to hear any of these frequencies in use for at least a year – in many cases, much longer.



WRKM-1350 is a typical small-town AM station. The station is located a few miles east of Carthage, Tennessee, on Highway 70.

In other recent FCC action, the second group of LPFM applications has been received. 473 applications were received for stations in Connecticut, Illinois, Kansas, Michigan, Minnesota, Mississippi, Nevada, New Hampshire, Puerto Rico, Virginia, and Wyoming. Some minor changes have been made to the LPFM rules to

address interference concerns. The same 3rd adjacent channel protection rules that apply to full-power stations will be applied to LPFMs within 600 kHz of a station carrying a radio reading service. (reading services are usually carried as subcarriers of NPR-affiliated public radio stations) And, an expedited modification procedure has been prepared under which complaints of significant 3rd adjacent channel interference from LPFMs to full-power stations will be resolved within 90 days.

Many of us remember a time in which a single company could own no more than 12 AM and 12 FM stations in the U.S.. It wasn't all that long ago! Well, times change. On August 15, the FCC approved the merger of AMFM and Clear Channel. To avoid problems with ownership rules, the merged firm is required to sell 122 stations in 37 cities – five times as many stations as were permitted to one owner under the old rules. They'll be allowed to keep 490 stations!

❖ Bits & Pieces

- Russ Johnson in North Carolina wrote asking about moderately-priced receivers for FM DXing. I'm lucky – I found a good tuner for a good price at a closeout sale in a Wisconsin professional-audio shop. And my experience has been that high-end stereo tuners really are generally better FM DX machines. But there are plenty of people DXing FM with less expensive gear. I have had some successes with both the GE SuperRadio II and the Sony ICF-2010, though the latter radio is somewhat short on selectivity on FM. I would visit my local high-end audio store and see if they have any older tuners on closeout. Do any readers have any other suggestions?

- Kevin Redding passed along news of a frequency swap in Phoenix. News/talk station KFYI is trading its 910 kHz dial position to all-sports KGME in return for KGME's 550 kHz

channel. Both stations are commonly-owned by Clear Channel. While the 550 kHz frequency is actually lower power at night (1,000 watts vs. 5,000 watts on 910), the lower frequency will offer better coverage. Also, all of the 5,000 watt signal on 910 is directional to the south, presumably to protect KALL Salt Lake City. 550 kHz is non-directional, and should have a much better signal in areas north of Phoenix.

We're at the peak of the AM DX season. Some of you along the coasts stand a chance of hearing foreign stations; be sure to check out the "split" frequencies between the North American stations for a shot at something more exotic. At the end of the month, we have the winter E-skip season for FM and TV DXers. Last summer offered some interesting skip; maybe we'll have more of the same for the winter season? Let us know what you're hearing. Write: w9wi@bellsouth.net or Box 98, Brasstown NC 28902-0098. Good DX!

Table One: FCC AM License Proposals

AK	Big Lake	1110	HI	Ewa Beach	1320	NV	Reno	550
AL	Fort Deposit	770	ID	Meridian	890	NY	DeRuyter	780
AL	Level Plains	1490	ID	Pocatello	1440	NY	Gloversville	1440
AL	New Brockton	600	ME	Hermon	1230	NY	Mexico	1510
AS	Tefuma	580	ME	Veazie	1340, 1400	OR	Bend	1170
AZ	Ajo	1340	MI	Albert Twp.	1060	OR	Redmond	1240
AZ	Casa Grande	650	MI	Carney	1200	OR	Warrenton	1570
AZ	Kachina Village	1490	MI	Deep River	710	PA	Avondale	1230
AZ	Nogales	1340	MI	Gladstone	1300	PA	Reading	870
CA	Blue Lake	1450	MI	Houghton	750, 1340	SD	Pierre	1450
CA	Shasta Lake City	1330	MI	L'Anse	1490	TN	Harriman	1230
CA	S. Lake Tahoe	1400	MI	Lake Township	990	TN	Lebanon	1490
CO	Palasade	810	MI	Mackinaw	1430	TX	Frankston	890
CO	Pierce	870	MI	Manning	1390	TX	McGregor	840
CT	Falls Village	1400	MI	Reed City	1120	TX	Midland	880
CT	Oakville	1590	MI	Rogers Hts.	740, 1010	UT	Fillmore	1350
CT	Torrington	1490	MI	St. Ignace	1470	UT	Moab	1490
CT	Uncasville	1490	MI	Springvale	1160	UT	Parowan	1400
FL	Alachua	1090	MN	Verndale	1070	UT	Taylorsville	820
FL	Ensley	1140	MO	Hollister	1570	UT	Tremonton	1470
FL	Golden Gate	960	MT	Lockwood	1450	VA	Exmore	890
FL	Orlovista	1120	MT	Malmstrom AFB	1490	VA	Glen Allen	1480
FL	Silver Springs	1210	NC	Havelock	800	WA	Cashmere	1110
FL	Sweetwater	880	NC	New Bern	1160	WA	Pullman	650
FL	Winter Springs	890	ND	Minot	1430	WI	Oneida	850
GA	Cordele	1490	NH	Jaffrey	540	WI	Whiting	870
GA	Moultrie	1400	NH	Lebanon	1490	WV	Welch	1340
GA	Waycross	1230	NM	Artesia	1280	WY	Jackson	1400
GU	Tamuning	675	NM	Farmington	1090	WY	Pine Bluffs	540

(AS is American Samoa, and GU is Guam. While North America is in ITU Zone 2, Guam is in Zone 3 - 675 kHz is a valid AM frequency in Zone 3.)

Best SW Radio Site: Clandestine Radio Com

Nick Grace and Martin Schoech have announced a merger of their excellent clandestine radio web sites. Nick's *Clandestine Radio Intel* and Martin's *Clandestine Radio Watch* newsletter are now found on a single site. This amazing new service, *Clandestine Radio Com*, is at <http://www.clandestineradio.com/index.html> on your internet dial.



Nick Grace's clandestine station web site has won numerous awards for web site quality, most of which came from judges who are not radio hobbyists. Martin's bi-monthly newsletter remains the most detailed current source for clandestine broadcasting news on a worldwide basis. Given the merger of these two outstanding web services, Clandestine Radio Com gets our vote as the best web site in shortwave radio today.

Throughout late 2000, the site was frequently modified to stay current in world hot spots like the Balkans and the Middle East. Anybody with an interest in unlicensed radio broadcasting, or world affairs in general, will definitely need to make frequent trips to this bible of clandestine radio.

❖ Holiday Pirates

Pirate broadcasting traditionally increases around holidays. As usual, Labor Day, Columbus Day, and Halloween saw pirate activity that was higher than normal. As you're reading this, Thanksgiving, Christmas and New Years are coming up. Barring a major catastrophe, weekends around these holiday periods should be excellent times to tune the pirate bands for unusual transmissions. With winter propagation at hand, most of the activity will be a couple of hours either side of your sunset. But, with solar activity high, bands are remaining open later. Plus, some pirates operate during local daylight hours.

❖ What We Are Hearing

Once again this month, *MT* readers heard nearly two dozen North American shortwave pirate stations, all on 6950 or 6955 kHz. This variety shows us that pirate radio remains very much alive.

Ground Zero Radio- Supposedly transmitting from an abandoned missile silo, their rock music is spiced with comedy ads

and political commentary. (uses gzrsw@usa.net e-mail)

Knuckleheads- Some pirates are strange, and this one is a good example. Their first broadcast in October was rock music spiced by an announcer who said nothing but several repeats of "knuckleheads." We don't know who he was talking about. (None)

KRMI- Their Australian Olympics coverage focused primarily on trips by athletes to brothels in Sidney. The call letters stand for Radio Michigan International. (None)

Radio Azteca- Bram Stoker's comedy focuses entirely on DX hobby issues and individuals. This is genuinely funny stuff. (Belfast)

Radio Free Euphoria- Captain Ganja has returned after a sabbatical, where he further refined his advocacy for cannabis. Novelty tunes and comedy work their way through the drugs on this station. (Belfast)

Radio Free Speech- Bill O. Rights is not as active as he used to be, but his mix of comedy and advocacy for political freedom is entertaining. (Belfast)

Radio Neptune- This new one surfaced with a "Universal Service" test featuring music played at a speed faster than normal. (Blue Ridge Summit)

Radio Three Parody- Sal Amoniac's ancient rock oldies station has drawn a parody imitator. You can usually tell the impostor from the real thing by heavy sarcasm in its discussion of pirate broadcasting. (None)

Radio USA- No other pirate has been on the air as long as Mr. Blue Sky. For seventeen years his punk rock, comedy, and pirate commentary have entertained many thousands of listeners. (Belfast)

Raven Radio- This one isn't brand new, but we still know very little about it. Recent tests could indicate a return to active broadcasting. (None)

RBCN- Radio Bob's Communications Network always features original comedy productions. When Radio Bob is around the bands, you're in for a treat. (Lula)

Scream of the Mosquito- They apparently parody "Scream of the Butterfly," an ex-pirate now resident via relay on 7415 kHz at **WBCQ**. (None)

Sycko Radio- Don't be fooled by the unusual spelling; the station name is pronounced "Psycho." Lately they have mixed rock and comedy in a standard pirate format, but they still aren't soliciting listener response. (None)

Voice of Shortwave Radio- Recent shows have been long, well-produced

drama features. Here's a station that puts a lot of work into their programming. (Blue Ridge Summit)

WHYP- The most active North American pirate combines rock music with weather for cities near Lake Erie. Announcer James Brownard once gave predictions for last week's NFL football games. (uses whyp1530@yahoo.com e-mail)

WMFQ- Their chanted IDs always contain an obscenity, but it's in there for a purpose. They are the biggest promoters of pirate radio QSLs in the hobby today. (Providence)

WLIS- Most licensed shortwave broadcasters have a signature theme song that they transmit before their shows for tuning purposes. These "interval signal" ditties are played like hit tunes on this pirate. (Blue Ridge Summit)

WPN- The World Parody Network is well named, since its shows are dominated by comedy and humor. (Huntsville)

❖ Reports and QSLs

Reception reports to pirate stations require three first class stamps for USA maildrops or \$2 US to foreign locations. This finances postage for a souvenir QSL to your mailbox. Your letters go to these addresses: PO Box 1, Belfast, NY 14711; PO Box 28413, Providence, RI 02908; PO Box 24, Lula, GA 30554; PO Box 109, Blue Ridge Summit, PA 17214; and PO Box 11522, Huntsville, AL 35814. Some pirates, as listed, prefer e-mail reports instead.

❖ Thanks

Your input is always welcome via PO Box 98, Brasstown, NC 28902, or via my e-mail address atop the column. We all thank this month's contributors: John T. Arthur, Belfast, NY; Kirk Baxter, North Canton, OH; James Brownard, North East, PA; Ray Carmen, Green, OH; Ross Comeau, Andover, MA; Cheryl Dragel, Austin, TX; Ullis Fleming, Glen Burnie, MD; Harold Frodge, Midland, MI; Nick Grace, Washington, DC; Raul Gonzalez, Santiago, Chile; Paul Griffin, San Francisco, CA; Sheldon Harvey, Montreal, Quebec; William T. Hassig, Mt. Prospect, IL; Vince Havrilko, Beale AFB, CA; R. Haenggi, Sternenbergl/Gfell, Switzerland; Maryanne Kehoe, Atlanta, GA; Fred Kohlbrenner, Philadelphia, PA; Eileen Lazar, Vineland, NJ; Chris Lobdell, Stoneham, MA; Greg Majewski, Oakdale, CT; Cachito Marnani, Santiago, Chile; Martin Schoech, Merseburg, Germany; Lee Silvi, Mentor, OH; Bud Stacey, Setsuma, AL; and Niel Wolfish, Toronto, Ontario.

The Prime Season

What is it about December? For some reason this month always seems to bring heightened interest in longwave DXing. Whatever the reason, it is a welcome change, and we intend to give you many things to do this month besides shoveling snow!

❖ Chasing Euro-Broadcasters

The interest in this topic never ceases, no matter what the season. Yes, you can hear these stations in North America, but you should not expect “armchair” copy. On a clear winter night, you can often make out what’s being said and recognize songs, but you probably won’t consider the signals to be “strong” by any means. The key is to listen at times when there is a complete path of darkness between you and the transmitting station.

There are many reliable stations but these are the ones reported to the column most often:

Freq.	Location	Power Out.
153	Algeria	250 kW
162	France	2000 kW
171	Russia	6400 kW
183	Germany	2000 kW
189	Iceland	300 kW
198	England	600 kW
234	Luxembourg	2000 kW
252	Ireland	500 kW

❖ Beacons

Chasing non-directional beacons (NDBs) is another popular activity during the winter months. Low and medium powered beacons are sprinkled throughout North America and occupy the band between 190 and 535 kHz. These stations do not have very interesting programming – just a slow, repetitive CW message (their ID). However, it is not the content we are interested in, but the *fact* of reception.

Most beacons operate with less than 50 watts of power (25 watts in many cases) from small, unmanned shacks. They utilize a rather small antenna, and are not meant to be heard more than 100 miles or so away. Imagine the thrill of pulling one in at five or ten times this distance.

As with broadcasters, nighttime is the best time to listen for beacon DX. Often you’ll hear several stations on a single frequency, and will need to sort through them to pick out the IDs. To do this, it helps to know a thing or two about ID formats. For instance, Canadian IDs can usually be identified by two primary traits. First, they typically use a 400 Hz modulated tone (as opposed to 1020 Hz commonly used in the U.S.) Also, they will have a long dash after the ID

(DAID). U.S. beacons do not have a dash after the ID. Using these traits alone, you should be able to quickly determine a beacon’s country of origin.

When hunting beacons, don’t neglect the band during the daytime. Although you won’t hear stations from as far away during the day, you’re likely to hear some beacons that are covered up by DX at night. In fact, some DXers enjoy the challenge of daytime monitoring. An intercept of 400 miles or more during the day would be a prized catch indeed.

❖ Lowfers

Moving down the band a bit, let’s explore a unique sliver of spectrum from 160 to 190 kHz. Officially, this is the Part 15 band, where the FCC allows a variety of low powered devices such as wireless intercoms and power line carriers to operate without a license of any kind. An industrious group of experimenters have been using this band for ham-like operation since at least the early 1970s.

Limited by regulation to 1 watt and a 50 foot/15 meter antenna, these experimenters operate their stations in an effort to “push the envelope” of low power communication. Take a slow spin through this band and you might be rewarded with a Lowfer intercept. For an online list of active stations, check out <http://www.lwca.org/sitepage/part15/lmfbcns.htm>.

A little further down at 136 kHz, you may find more experimental activity. In many countries, governments permit amateur access to this frequency with much higher power limits than those



LLX/353 kHz, Lyndonville, VT. This beacon is typical of those used at small, private airfields.

imposed on the “Lowfer” band. In fact, even in the United States and Canada there are a few stations operating here with temporary authority. If you’re within a few hundred miles of northern Virginia, you might listen for experimental station WA2XTF run by AMRAD (<http://www.amrad.org/projects/lf/>). If you live in or near Ontario, Canada, you could try for VA3LK and VE3OT who are both active on this band.

Speaking of 136 kHz, a significant record has already been established here. In the spirit of the 1920’s transatlantic tests, a crossband (LF-HF) contact between the UK and Canada was made on September 10th. The operators were

Dave Bowman, G0MRF (UK) operating at 136 kHz and John Currie, VE1ZJ (Cape Breton Island, NS) operating on 20 meters. The LF signals were not actually “heard,” but rather seen on a computer screen using spectral software. Work is continuing on a two-way LF contact between North America and the UK, and may already have occurred by the time you read this.

❖ Going Lower

Below 136 kHz, the main signals you’ll hear are military RTTY stations sending encrypted data. These powerhouses are at various locations in the U.S. and can frequently be heard around the clock. At 60 kHz, you should be able to hear the pulsating carrier of WWVB in Fort Collins, CO. (Newcomers often confuse this signal with slow Morse Code.)

WWVB is the sister station of WWV operating at 2.5, 5, 10, 15 and 20 MHz. Longwave time stations have the advantage of providing a more stable, ground-hugging signal that is desirable for automated time keeping and laboratory applications. Today, it’s even possible to buy an inexpensive (under \$50) table clock that locks onto WWVB and provides extremely accurate time that *never* needs to be reset. Look for more applications of WWVB in the future, including affordable wrist watches and VCRs with WWVB capability.

Best wishes from the Carey family to you and yours for a joyous holiday season. See you next month!

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All I Want for Christmas

Now most folks would think that around this holiday season, Old Uncle Skip would want to run a big long list of gear and goodies that he would want to find under his Christmas tree. The fact is that, as far as equipment goes, I'm feeling fairly content these days. I have a couple of nice transceivers that get me where I want to go and about as much antenna as my XYL and the neighbors will put up with. I always have something down on the workbench that I am "improving." Conditions are as good as they have been in many years.

Ham Radio life is good here at N2EI. For me, at least, Santa can just make a point of running his sleigh through the ionosphere a couple of times to kick up the propagation. You see, for me, December is a great contest month. Being one of those folks who tries to get their holiday "business" out of the way in short order, I can usually find a few hours to devote to the bands and the fun of some light contesting, emphasis on the light.

Let me unpack this notion of light contesting a bit. Pick up any of the ham magazines that list contest scores. It is easy to see that only a small percentage of the stations listed are really putting themselves in a position to "go for the gold." Contesting at the competitive level takes a certain amount of work and dedication that I admire, but also feel okay admiring from afar.

It doesn't take too long to figure out that you can enjoy participating in any amateur radio contest by setting personal goals. These can be fairly humble by the standards of the contest rules, but they can serve to get your competitive spirit going. A good goal for any newcomer to the HF bands would be to try for 10 new countries in a DX contest. Maybe you could shoot for working all counties in your state QSO party.

My friend Jon WB2KKS always tries to work all states during "Sweepstakes" weekend. I often go into a contest looking to fill in the blanks on my countries list or the few "hard ones" left on 5 band WAS (Worked All States). Sometimes I don't even make that much of a plan. I just dive in head first and start giving out points, taking time to see what I've actu-

ally accomplished only when the contest is over. Whatever your contest motivation may be, December is a great month to give it a go. Let's take a look at what's out there.



The HTX-10 would be a great rig to use during the 10 meter contest.

dominated by high speed operators, the overall conditions on 160 encourage operating at more moderate speeds. Amongst those "speed demons" you will find plenty of folks operating at a pace that will encourage the newcomer to CW contesting.

A fun goal for this contest first time out of the gate might be to work 10 states.

ARRL 10 METER CONTEST December 9-10

I'd have to dig back into my logs to be sure, but I think I've participated, to some degree, in just about every annual ARRL 10 Meter Contest since I first had HF privileges. The second full weekend of December brings a lot of people on to 28 MHz. Even in years when conditions were abysmal, I was always surprised to see how many stations could be worked. Now that the solar cycle has come back around, things should be very exciting on 10 meters.

This year the contest runs from 0000 UTC December 9 through 2400 UTC December 10.

You're allowed to work any 36 hours out of that 48 hour period. (Listening time counts as operating time.)

If you are inclined to submit your scores, there are nine different single operator categories: You can submit logs reflecting either CW only, phone only or mixed mode (CW and phone) in either the QRP (5 watts PEP or less), low power (150 watts PEP or less), or high power (more than 150 watts PEP). You can operate a multi-operator from a single transmitter in mixed mode only.

The contest exchange is callsign, signal report, and state or province. DX stations use a serial number in lieu of state. Are you a Novice or Technician that wants to attract attention? Novices and Techs should sign /N or /T respectively when working CW because you then will count for a whopping 8 points. That should make you very popular indeed.

As I mentioned earlier, we're at the top of the cycle and that makes 10 the place to be. When conditions are good, modest power and antennas will work everything on the band. Want to set a good goal for your first time out in this contest? Try to work all 10 callsign districts. Once you do that, go for KH6 (Hawaii) and KL7 (Alaska). Keep in mind that this is

ARRL 160 METER CONTEST December 1-3

Not everyone takes the time to explore the 160 meter band. This may be due to all those years that ham gear came in 5 band packages. It may also be due to the fact that optimum antennas can be a bit unwieldy. Still, 160 has a lot of adventures to offer anyone who gives it a shot. I don't think I've ever had the opportunity to put up a full size 160 meter antenna. I've always managed by loading up the longest wire I had up at the time. My totals never made the top of the contest list but I always had a lot of fun anyway.

The ARRL 160 Meter Contest is a great time to give 160 a try. Activity is high and noise (always a factor on 160) is low. This is a CW only contest with three Single Operator categories: QRP (5 watts PEP or less), Low Power (150 watts PEP or less), or High Power (more than 150 watts PEP). There is only one multi-operator class and this is a single transmitter event. The contest exchange is callsign, signal report and ARRL/RAC section. DX need only send callsign and signal report.

Unlike many CW only contests that are

the kind of contest where DX is looking for YOU and not the other way around. 10 meters can produce some exceptional DX contacts when conditions are in your favor, so keep an ear open for overseas signals.

STRAIGHT KEY NIGHT

December 31 - January 1

I've never been much of a party animal on New Years Eve so I usually look for other diversions. The gathering on the ham bands known as Straight Key Night is probably my favorite contest of all. The reason? Because it is probably the most un-contest-like contest in the world. The rules are simple. Dust off your hand key (no electronic keyers allowed) and put it on the air! Oh, there are probably a few other rules but I don't know that anybody ever pays a great deal of attention to them. This is a purely fun time.

SKN runs from 7:00 PM EST December 31 (0000 UTC January 1) through 7:00 PM EST January 1 (2400 UTC). The purpose of this exercise is to get on the air with your straight key and chat with folks. One way of letting folks know you're participating is to substitute the letters SKN for RST when giving your signal report.

I have a humble collection of keys and I al-

ways make a point of bringing out my favorites for this event. My battered and bruised wartime J-38 (oh... the stories it could tell) and my diminutive American Radio "spy" key.

QSOs are light hearted, usually discussions of the various keys and "fists" heard on the air. Last year there was a lot of fun conversation about being ready with CW when Y2K crashed everything else.

Participants are encouraged to submit lists of contacts and to vote for Most Interesting QSO and Best Fist. If you join in you will hear a lot of us shaky "glass arm" types banging away as best we can. But as you tune around you will hear some folks who practically make music with their keys. Electronic keying has made good ops of us all but to hear someone who can really fly with a hand key is a singular pleasure.

The goal for this contest is to have fun – nothing more, nothing less. I guess you could say that, like most folks, I spend New Year's Eve with my friends.

You can find a great deal more information about these contests and how to submit your logs and results for consideration at The American Radio Relay League web site <http://www.arrl.org>

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Noise: The Arch-Enemy of Radio Communication

In one way of looking at it, your receiver's sensitivity is a measure of the minimum signal strength which will produce an intelligible signal at your receiver's output. The primary factor which limits a receiver's usable sensitivity is electrical noise – noise can partially or completely mask over the received signal. At times, as we all know, this can make reception difficult or impossible.

❖ Signal to Noise Ratio

Because electrical noise is an important consideration in determining the quality of a received signal a concept called "signal to noise ratio" or "(S/N)" has been developed. The stronger the signal the higher the S/N, and the stronger the noise the smaller the S/N. For the best quality of reception a high S/N (i.e., signal predominating) is desirable. A low S/N means there is a strong noise component along with the signal being received, and quality of reception is degraded.

❖ Sources of Electrical Noise

Some of the electrical noise which competes with the received signal that we want to hear originates in the world outside our receiving equipment. This noise is picked up by the antenna and fed to the receiver. Such noise is called "external noise" or "received noise." On the other hand, some of the noise which competes with received signals comes from within the receiver itself. This noise is called "internal noise."

Receiver circuits are designed to generate relatively little internal noise, but there is always some noise generated by the components of the receiver. In most instances, for HF or lower frequency reception internal noise is sufficiently low such that its effect on reception is

unimportant in relation to the effect of the higher level of received noise. In other words, at HF and lower frequencies, it is typical to find that the level of received noise sets the limit to the minimum strength of received signal needed to overcome the signal-masking effect of the overall noise. Therefore, for DXing or other weak-signal work at these frequencies we should reduce received noise as much as possible. Let's consider some ways in which we can do this.

❖ Reducing Received Noise

One way to reduce received noise is to prevent the noise from reaching the receiver. Some antennas are quite directive, and these antennas can often be oriented so that received-noise pickup is reduced. For example, beam antennas reduce noise and interference from all directions except for the main lobe of their beam (fig. 1A). Table top loops have deep nulls (directions of minimum reception, fig. 1B) which can be used to reject noise from a specific direction.

Once noise has entered your receiver there are ways to lessen its effect on reception. Your receiver's selectivity can also be of assistance in preventing noise from reaching the receiver's output. The receiver's overall bandpass must be sufficiently wide to pass the desired signal, but beyond that the more nar-

row the receiver's bandpass the less noise will be able to come through along with the signal. This selectivity can be obtained in the radio-frequency, intermediate-frequency, or audio-frequency stages of the receiver.

Noise-reduction devices are available which utilize a separate antenna placed to receive mainly noise; output from this antenna is used by the device to cancel noise received on the main antenna.

❖ Natural Factors Affecting Received-Noise Levels

Static, also known as "sferics," is less prevalent on the HF and lower bands in the northern hemisphere in the winter months than the rest of the year. Another factor that affects static levels is latitude. Because thunderstorms tend to be heaviest in equatorial regions, the closer a receiving station is to the poles the less static is received.

Although the relatively constant background of static is primarily due to distant thunderstorms, static-like interference and other bothersome electrical noise is also generated from man's use of electrical devices. Particularly where there is a lot of heavy, electrical, industrial machinery in use we will usually find high levels of electrical radio interference.

So-called "cosmic noise" is the relatively weak radio interference which comes from natural electrical activity in outer space. For some weak-signal activities, such as moon-bounce, radio interference from the sun can be a problem.

❖ Relative Noise Level and Its Effect on Reception

As explained above, on the HF and lower-frequency bands there is typically so much received noise that the

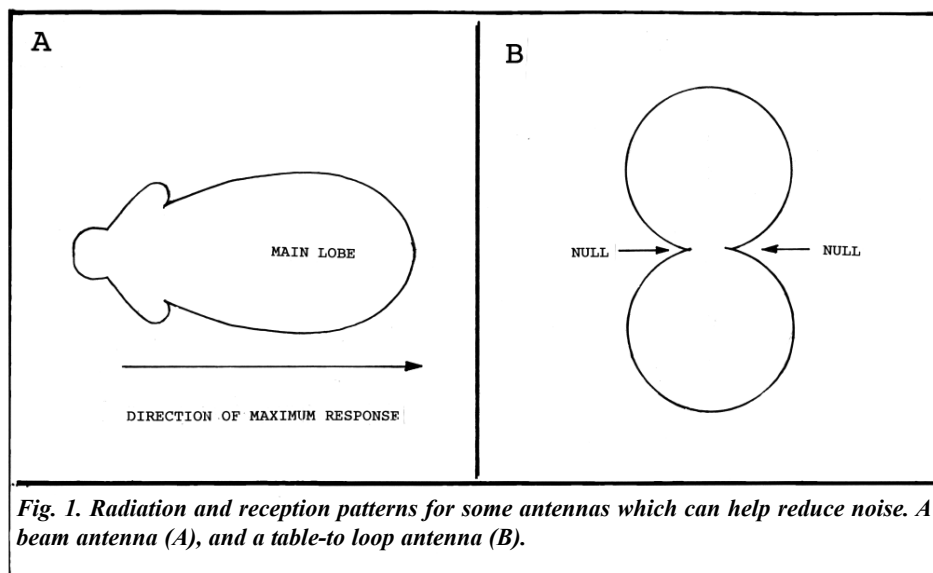


Fig. 1. Radiation and reception patterns for some antennas which can help reduce noise. A beam antenna (A), and a table-to loop antenna (B).

This Month's Interesting Antenna-Related

Web site:

http://www.webproforum.com/smart_ant/ teaches you what a smart antenna is.

Send in your suggestions for inclusion here as an interesting antenna-related web site to: clemsmal@bitterroot.net.

quality of reception is essentially determined by the existing ratio of received signal strength to received noise (the received S/N). In this case there is little to be gained by increasing signal strength by amplifying the received signal, or by better matching to the antenna system. This doesn't change the S/N because you can't avoid increasing the strength of the noise, too.

When received noise is low then internal noise becomes the dominant noise competing with the received signal, and then internal noise is the limiting factor in quality of reception. Here low-noise amplification, and appropriate antenna matching can improve received-signal quality. If you want to demonstrate internal noise for yourself turn the squelch off on a VHF or UHF receiver or scanner, and then disconnect the antenna. With the antenna disconnected the noise you then hear is not received noise, but the receiver's internal noise.

❖ Increasing Signal Strength

From the above discussion we see that when received noise is lower than the receiver's internal noise we can improve reception quality if we increase the strength of the signal coming from the antenna. So in those low-noise situations described above it may well pay off with improved HF reception to utilize such devices as additional RF amplifiers, antenna tuners and preselectors.

Antenna tuners, or transmatches, are devices which create an impedance match between a source (such as your antenna system), and a load (such as your receiver's antenna input circuit). When the antenna system and receiver input are matched there will be optimum transfer of signal from the antenna system to the receiver. In low-noise situations this can lead to better reception of weak signals.

Preselectors are devices with circuits tunable to the frequency of the desired signal. For some receivers preselectors can help reduce received-noise level slightly in high-noise situations by the additional RF selectivity they add to your receiving system. Some preselectors also have built-in amplifiers, and these can help in low-noise situa-

tions by increasing the strength of weak signals. It is important that the amplifier in the preselector be a low-noise amplifier, or it can add internal noise and degrade reception.

And again, we mustn't overlook the antenna's contribution. In addition to the noise rejection already mentioned for directive antennas, those antennas with useful gain levels can also increase the strength of the desired signal and thus improve reception in low-noise situations.

❖ Summing It Up

Noise is the great enemy of weak-signal reception. Depending on the situation, reducing internal noise or external noise can sometimes significantly improve the quality of your reception.

RADIO RIDDLES

Last Month:

I said: "Well we've just talked about radio horizons, and radio grounds. Now what is 'radiovision'?"

Well, radiovision is an antiquated name for television. For some reason "television," which means "seeing across a distance," caught on. "Radiovision," which means "seeing by radio," just didn't make the cut.

This Month:

Well we've talked about radio horizon, radio ground, and radiovision. Now tell me what "radionics" means.

You'll find an answer for this month's riddle, and other interesting, antenna-related web site, and much more, in next month's issue of *Monitoring Times*. 'Til then Peace, DX, and 73.

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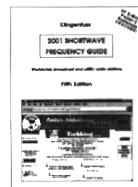
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90 MONITORING TIMES December 2000

schematic, and you'll see the field – along with the two 20-mF filter caps – coming off the cathode of the 35Z3 rectifier tube. As you can see, if the second filter cap (the one to the right of the field) were to become shorted, all of the power supply current would flow through the field....and *poof!* Although the original of the Rider schematic I'm using here is a bit blurred, you may also be able to see that the field is marked "300 ohms." This is its d.c. resistance.

A shorted filter cap was a common occurrence because such caps are of "electrolytic" design; their performance depends on the integrity of a thin film of "electrolyte," which dries out and deteriorates with age.

When a dynamic speaker is to be replaced with a "PM" speaker, a substitute power supply filter choke has to be installed. Instead of a choke, the usual service practice was to install a power resistor (with about a 10-watt rating) whose resistance was equal to the d.c. resistance of the original choke. At the same time, the filter caps were usually upgraded to a larger value (at least one of the old ones was burned out anyway and the other one – if still good – was certainly on its way out). A check of the wiring showed that the "mystery" power resistor in our set was wired as a choke replacement and the caps had been upgraded from 20 to 30 mF.



Function of square-topped shallow metal can located under the chassis was a mystery until I checked the schematic. It turned out to be the second i.f. transformer.

By the time PM speakers came along, filter electrolytics were commonly available, quite inexpensively, in larger sizes. The upgrading helped compensate for the fact that the new filter "choke" had only resistance; not resistance plus inductance as in a true choke. Newer sets with PM speakers designed into them also used a power resistor and larger caps in the power supply filter circuit. This arrangement was quite satisfactory and, as long as the caps were good, there was no noticeable power supply hum audible in the speaker.

❖ Re-Evaluating the Problems

The little Transitone that I selected to be a good example of an AC-DC set restoration has

fooled me on a couple of counts. First through being equipped with Loktal instead of the usual Octal tubes; next through having its major problems solved by a previous repair person. The more common occurrence is to find that the set you'd like to restore has unsolved problems or problems that have been "solved" by casual or botched repairs.

I can't even use the set as an example of the wholesale recapping that I recommend for most restorations. Taking a closer look at the radio, I find that the busy little elf who preceded me has already replaced the filter electrolytics, and all but one of the old wax caps, with new ones. Except for that one, the handful of caps that I picked up in Rochester will have to wait to be installed another set.

Apparently my predecessor (or whoever hired him) was as taken with the little Philco as I was. Normally we don't find such extensive repairs on such an inexpensive radio. However, I am wondering if performance was not a bit degraded by the fact that a tube with a higher voltage heater than specified was installed and that a 500-ohm resistor was substituted for the 300-ohm speaker field.

The tube substitution would have lowered the voltage on all of the tube heaters, and the use of a 500- instead of a 300-ohm filter resistor would have lowered plate and screen voltages throughout the set. However, judging by the care with which the repairs were made, my guess is that the performance must have been quite satisfactory. Otherwise the set would not have been left as it was.

Well, I've spent so much time talking about the previous repairs that I'll have to defer a discussion of my own contributions until next time. But I think we've learned as much or more from studying this unsung repair person's work as we would have if I'd carried out the fixes myself. One of these lessons is certainly that one can often make repairs using parts on hand, even if they are not the values originally used.

I won't get into it with the purists who may object to this approach. In fact, I tend to be a purist myself. Both the purist and the functional points of view can be defended, I'm sure. And the approach you might favor will certainly be affected by the value and rarity of the set you are working on. I do recommend that any substitutions you may make be done in a "reversible" manner so that a future owner who wants to go to the trouble of making the radio absolutely original may still be able to do so.



Power resistor clipped to top of speaker frame replaced field coil when original dynamic speaker was swapped for a "PM" unit (see text).

Include a little note inside the set documenting the changes you have made. And if you do replace any defective original parts, it would be thoughtful to place the old ones in a little glassine bag to be tucked inside the cabinet along with your note. If you've replaced all of the original wax-covered caps, be sure to include them, too. Some folks (I'm not one of them) like to melt off the wax, retrieve the original paper tubes, insert modern caps inside, and re-apply the wax.

For next time, I intend to replace the one wax cap still in the set. I can see why it was ignored because it is buried deep and is going to be a lulu to get at. However, my predecessor has left me so little to do that I can't complain! I also plan to spend some time replacing deteriorated hookup wire. Then, after the volume control receives a bit of cleaner/lubricant spray and I give the top of the chassis (including the tuning capacitor plates) a light cleaning with some canned air, we should be ready to plug in the little "Transitone" and try it out.

All of which goes to show that you certainly don't know what you are going to find inside a radio until you take it out of the cabinet. And that's part of what makes this hobby so much fun! See you next time.

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Attenuators Tame Your Outdoor Antenna

by Philip Gebhardt

Today's receivers are so sensitive that you can hear almost any signal you want – provided you have a good outdoor antenna. A few years ago, reception of Radio France Internationale's 1400 UTC English transmission on 17650 kHz was poor until I connected an outdoor antenna to my DX-440. And I couldn't even hear Radio Nigeria's 4770 kHz broadcast at 0430 UTC without an outdoor antenna.

The added signal strength of an outside antenna can minimize the effects of fading. Radio Moscow's broadcast experienced heavy fading at 1445 UTC until I connected the antenna. The extra signal strength meant that when fading was heaviest the signal was still strong enough to keep the receiver's audio output level at maximum.

An outdoor antenna can also extend your listening time, since it brings extra signal strength into your receiver during those periods when propagation from an area is just picking up or when signals are dying out for the day. For example, one morning I heard Radio Australia's 9580 kHz transmission until 1415 UTC with the DX-440's built-in telescoping antenna. With an outdoor dipole, I was able to extend that time to 1500 UTC.

Some antennas exhibit directional properties which can be a real advantage. And, you can select from designs which feature single band or multiband operation.

From all of this it sounds like the outdoor antenna is the best thing since sliced bread. However, not all the characteristics of outdoor antennas are beneficial. An outdoor antenna not only brings in the weak signals you couldn't hear before, but it also boosts the level of the big, high-power stations. The extra signal strength on already strong signals will cause the AGC (automatic gain control) to reduce receiver gain. As a result, a weaker signal on a nearby frequency may not be amplified sufficiently. This effect is known as desensitization.

Sometimes a strong signal causes overload-ing problems. Consequently, spurious signals appear even though the strong signal may be elsewhere in the band or even outside the band.

And finally, a strong signal will cause the receiver to lock too soon while in the scanning mode. For example, when connected to a simple half-wave dipole, my DX-440 stopped scanning

on 6170 kHz even though the BBC World Service actually transmits on 6175 kHz. Once I put the receiver back into the scan mode, the receiver then locked on 6175 kHz; with another push of the scanning button it locked on 6180 kHz. Sometimes the antenna will boost the noise level to the point that the scanner locks onto noise every 5 kHz!

It would of course be nice to have the best of both worlds: an antenna with gain to bring in the weak stations and freedom from receiver desensitization, overload and incorrect scanner lock. And you can!

Tune in and tone down

A simple solution is to use an attenuator. As the name implies, the device decreases the signal level. The obvious question is: Why build an antenna to bring in extra signal and then build a device to decrease the signal? There are two reasons. First, an outdoor antenna can capture so much signal that even with the attenuator connected there will be more signal coming into the receiver than there would be with just the built-in antenna. Second, with the attenuator disconnected you can use the antenna's maximum gain to pull in weak stations.

The ideal attenuator would be built in a metal box, have several selectable levels of attenuation and have a switch to bypass the device if no attenuation were necessary. However, you can



The finished project. Crude, but it works!

still complete the project without metal boxes, rotary switches and panel mounted sockets.

The attenuators described here are built into a section of RG-58 coaxial cable. They attenuate signals on all frequencies from broadcast band through the tropical bands and up through all the world band frequencies. With the attenuator inserted in the antenna feedline, you can reduce the level of strong signals. When the attenuator is removed, you can benefit from your antenna's ability to pull in weak stations.

A typical pi-network attenuator is shown in Figure 1.

The concept is quite simple. R2 and R3 (along with the 50-Ohm receiver input) form a voltage divider which is connected directly across the feedline. The signal voltage across R3 and hence applied to the receiver input is less than the total voltage supplied by the feedline. By selecting appropriate values for R2 and R3, you can provide any value of attenua-

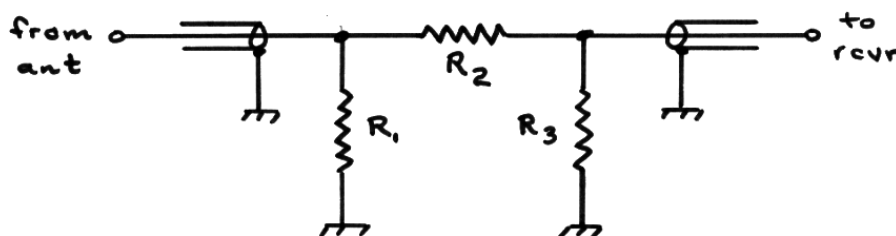


Figure 1. This simple attenuator uses three resistors in a pi-network.

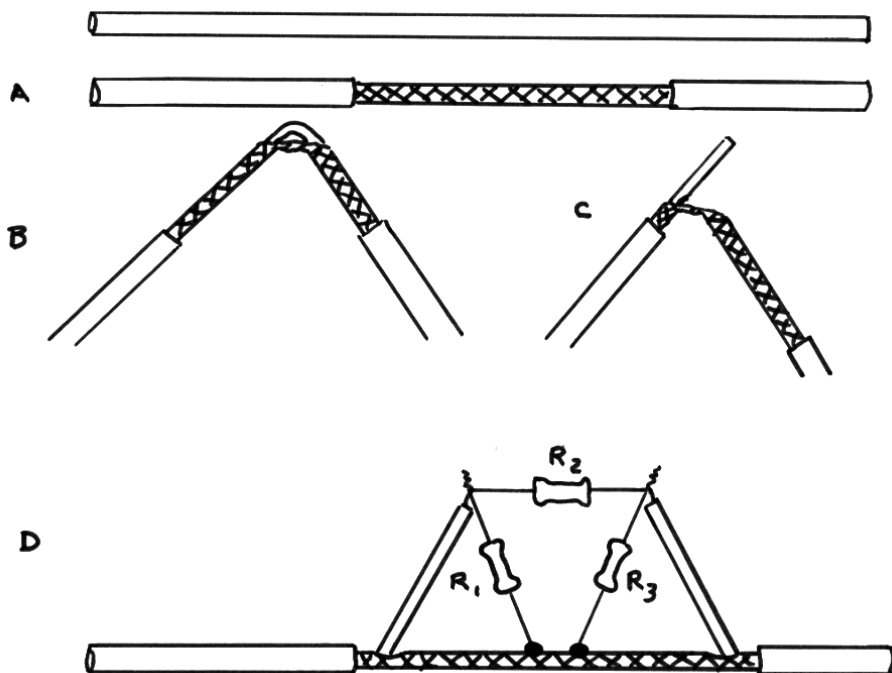


Figure 2. Constructing the attenuators involves a few easy steps.

A – Remove 3 inches (7.5 cm) of outer insulation from the center portion of a 12-inch (30 cm) piece of RG-58 coaxial cable using a sharp knife. Do not nick the shield!

B – Bend the cable in a U-shape and spread the shield strands at the center point. Cut the exposed center conductor. Do not cut the shield!

C – Bend the cable in a U-shape near one end of the exposed shield and spread the shield strands. Fish the center conductor through the opening in the shield. Repeat the procedure at the other end of the exposed shield.

D – Strip the insulation back 1/4 inch (6 mm) on both ends of the exposed center conductor. Connect R2 between the ends of the center conductor. Connect R1 between one end of R2 and the shield. Connect R3 between the other end of R2 and the shield.

E – Attach suitable male connectors to both ends of the cable.

tion necessary. With R2 and R3 connected across the feedline, the 50-Ohm feedline will “see” an impedance value other than the 50-Ohm load it wants. R1 simply reestablishes the 50-Ohm impedance the feedline needs in order to transfer maximum signal.

Table 1 lists values for R1, R2 and R3 for specific values of attenuation. For shortwave listening, precise attenuation and exact impedance match are not critical.

Notice that R1 and R3 are equal. This makes the attenuator symmetrical, which means it can be inserted in the feedline with either R3 or R1 at the receiver end.

A 6-dB attenuator reduces the signal by a factor of 2. For example, if the input signal from the antenna into a 6dB attenuator is 24 microvolts (μV), then the signal out of the attenuator

would be 12 μV . A 12-dB attenuator reduces the signal by a factor of 4. A 24 μV input signal would provide a 6 μV signal to the receiver. And an 18-dB attenuator reduces the signal by a factor of 8. The same 24 μV input signal would produce a 3 μV output.

Figure 2 shows how the attenuators are made.

Connectors on both ends of the attenuator are the same type as used on the feedline from the antenna. To use the attenuator, insert a coupler between the feedline and one end of the attenuator connectors and plug the other end of the attenuator directly into the antenna jack on your receiver. Figure 3 shows how the system looks with an attenuator in place. I used phono plugs on the antenna feedline and the attenuators because they push on and pull off very quickly.

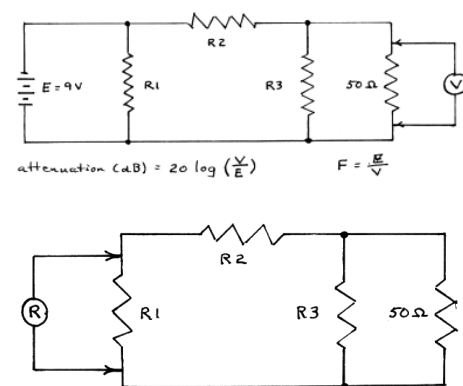


Figure 4(a). Attenuation level can be checked using a battery and a voltmeter. Note that the receiver is replaced with a 50-Ohm resistor.

Figure 4(b). Network resistance can be checked by placing an ohmmeter across R1. Note that the receiver is replaced with a 50-hm resistor.

Figure 5 shows how to check the attenuation and resistance of the devices, in case you're so inclined. If you do test the units, note that the receiver is replaced with a 50-Ohm resistor. This is necessary because the checks are being made with direct current rather than a radio signal. My 6-dB attenuator, for example, is actually a 5.6-dB attenuator.

Attenuators can be ganged. For example, a

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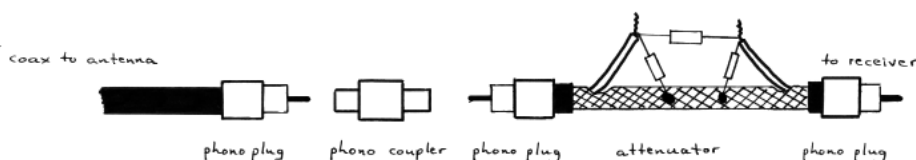


Figure 3. Phono plugs allow insertion or removal of an attenuator in a matter of seconds.

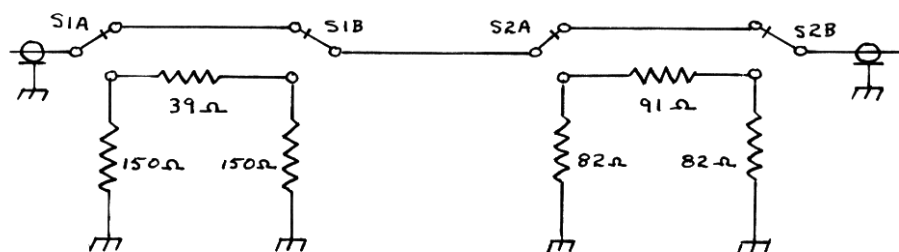


Figure 5. Switched circuits not only allow the attenuator unit to be inserted in the feedline permanently, but you can use fewer networks to achieve the same attenuation.

6-dB attenuator and a 12-dB attenuator in series provide a total of 18 dB of attenuation. And indeed, that's how devices built in metal cases are usually designed. However, constructing a single 18-dB attenuator makes the attenuator more compact and also reduces the chance that it will act like a small antenna and pick up signals. If you do decide to gang attenuators, Table 2 shows the attenuation you can attain by combining individual units.

If you do have the tools and parts to build your attenuator in a metal box, Figure 6 shows the schematic diagram of a unit which provides 0, 6, 12 or 18 dB of attenuation. S1 and S2 are DPDT miniature switches.

For those who wish to design circuits to obtain levels of attenuation other than 6, 12 and 18 dB, the formulas are:

$$R1=R3=\frac{50(F+1) \times R1}{50+R1}$$

and

$$R2=\frac{50(F-1) \times R1}{50+R1}$$

"F" in the above formulas refers to the factor by which you want to reduce the incoming signal. As mentioned previously, a 6-dB attenuator will reduce the signal by a factor of 2, a 12-dB attenuator reduces by a factor of 4 and an 18-dB attenuator reduces by a factor of 8. Maintaining this pattern, the next attenuator would reduce the signal by a factor of 16. However, you can reduce the signal by any factor you wish.

Also, keep in mind that you can "manufacture" resistors if you can't find the value you need. In a 9.5-dB attenuator (F=3), the value of R2 is 66 Ohm. If you can't find a 68-Ohm resistor (the closest standard value), you can use two 33-Ohm resistors in series or two 130-Ohm resistors in parallel. Whenever you have an option, however, use a single resistor.

Other Uses for an Attenuator

While the primary reasons for using an attenuator are to reduce overloading problems and false locking of the scan function, here are two

other projects to try.

If you construct three attenuators – 6, 12 and 18 dB – you can assess the effectiveness of your outdoor antenna. Using your receiver's built-in antenna, tune in a solid station that doesn't give a maximum reading on the signal strength indicator. Next, switch to the outdoor antenna and insert the 6-dB attenuator in the feedline. If the signal is still stronger than the strength with the built-in antenna, replace the 6-dB attenuator with the 12-dB version. If that doesn't bring the signal down enough, try the 18-dB device.

If the signal levels from the built-in antenna and the outdoor antenna are comparable with 6 dB of attenuation, then you know that the outdoor antenna provides twice as much input signal as the built-in antenna. If it takes 12 dB of attenuation to achieve the same signal level, then there is four times as much signal from the outdoor antenna. Of course, if 6 dB is not enough attenuation, but 12 dB is too much, then the outdoor antenna is providing between two and four times as much signal.

You can also use the attenuators to picture band conditions. Scan the band in question with the outdoor antenna connected, but no attenuation. Record the number of stations you hear. Now insert the 6-dB attenuator, scan the band again and record how many stations you hear. Repeat the procedure with the 12- and 18-dB devices. This will give you an idea of how many weak stations are among those you hear, how many are moderate and how many are strong. If you do this throughout the day, you can get a basic profile of band performance on a daily basis. If you take readings once a day periodically over sev-

Table 1

Attenuation(dB)	Reduction Factor	R1, R3(ohms)	R2 (ohms)
6	2	150	39
12	4	82	91
18	8	62	200

Table 1. Resistor values for pi-network attenuator described in the text.

Table 2

Attenuation	6 dB	12 dB	Total	18 dB	Attenuation
x					6 dB
		x			12 dB
			x		18 dB
x		x			18 dB
4			x		24 dB
		x	x		30 dB
x		x	x		36 dB

Table 2. Total value of attenuation when individual attenuators are ganged. x indicates which attenuators are used in the combinations.

eral months (or several years, if you're really ambitious), you can observe the changes in propagation over a long period.

Attenuators won't solve all your problems, but they can provide you with some advantages as well as some information about your receiver, antenna, and world band radio that you otherwise might not know.

Tech Toons



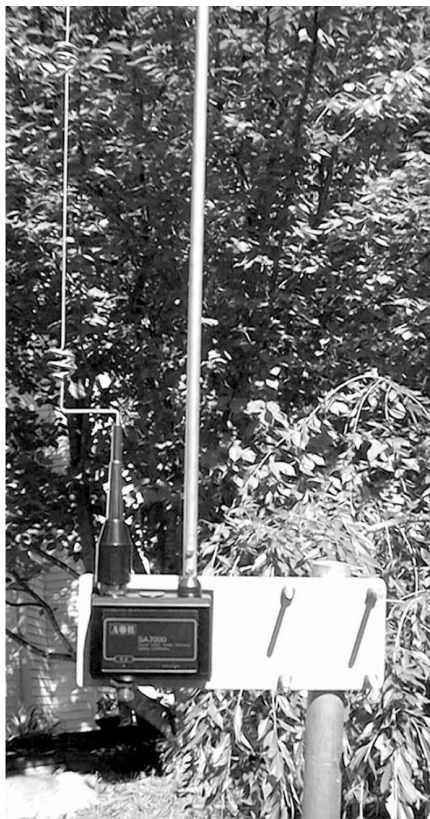
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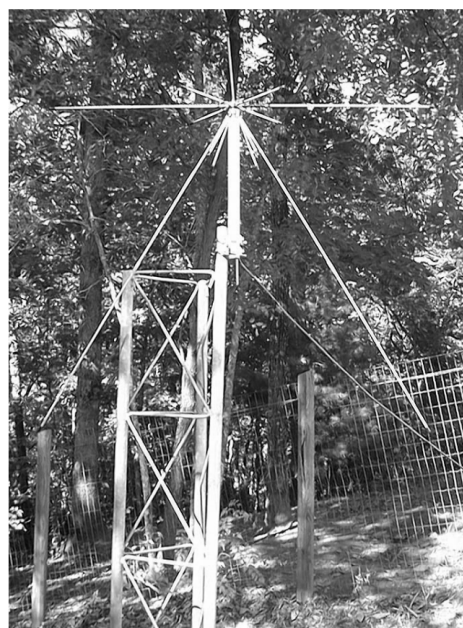
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Can You Teach an Old Dog New Tricks?

Over the course of the past decade or two, there have been excellent receivers that have tried to call themselves scanners, but did not quite make the grade. In one case, the Icom R7000, was definitely not lacking in RF design or signal performance capabilities. So why didn't it make the grade as a great scanner?

The answer lies in the design and implementation of its internal microprocessor controlled functions. Looking at it today, it now seems to us as if the microprocessor control part of the receiver was included as an afterthought and not fully integrated into the radio. Although innovative for its time with a number of scanning modes, including auto-saving, the scan rate is agonizingly slow. Take, for example, scanning memory channels. At about six channels per second, your cats could have kittens while you wait for the R7000 to scan all of its 100 memory channels!!

❖ Step into the Time Machine

Let's transport ourselves back to the late 1970s when these radios were designed. First, we must consider the state of the infant microprocessor/computer technology available at the time. Then, take into account these processors' relatively simple level of operation, high cost and the numerous support circuitry required. Now we have some insight into the answer to our question.

The processor in the R7000 uses a crystal based at 4.91 MHz. This might have been "state of the art" at the time. But today, it is clearly "state of the ARK."

Shift the time machine to 2000, where 133 MHz handheld computers are commonplace, and the level of functional circuit integration has wildly increased, while costs have plummeted. Is there a way to extract the best of these oldie-but-goodie receivers and bypass their 1970/80's computer control technology? That's what we will investigate this month, via a couple of new and updated software offerings.

❖ Are They Still Around?

Check on Ebay and you'll soon realize that there are ICOM R7000s around. For this discussion I started with programs which work with the R7000, such as Radio Max 5.4, ScannerWear 2.5, ScanStar version 7.62, and Scancat 7.5 SE. The authors of these programs are not newcomers to receiver control. Scancat and ScanStar were some of the first receiver control suites and their latest versions are still designed to work with many different receivers.

RadioMax's designer's first efforts were almost as many years ago, and were on the Commodore Amiga. This is where I first encountered a radio control program which provided speech announcements. ScannerWear has not been around

as long as the others, but has established itself as a simple to use package.

❖ Getting Started – Almost

All four programs loaded simply and easily on a Hewlett Packard Pavilion 3266. This is a 233 MHz, MMX Pentium I machine with 32 MB of RAM. This machine is getting on in computer years, but is a good entry-level computer on which to perform tests.

For the many years that I have used versions

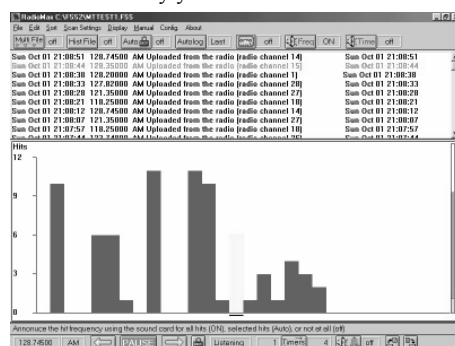


Figure 1 - Comparison of Memory Scan Speeds

of ScanStar, they have all been designed to add modules to your computers' start-up files. This version is no different. This approach worries me, since I never know which modules are always resident. These may be always running in the background whenever you turn on your computer. My concern is what other programs these affect. So far, with the latest version, I have not found any effect on the programs I run routinely. But be prepared to see your computer flash on the screen that four ScanStar modules have been loaded every time you turn on your computer.

Scancat, on the other hand, had some unpredictably "interesting" effects on the radio. For example, sometimes Scancat would not recognize that the R7000 was connected until the screen's tuning knob was clicked on with the mouse.

❖ On Your Marks

In my box of goodies I have a number of receiver interfaces that can be used with the R7000. I initially chose to limit myself to two. The first interface was produced by the Scancat people. The other was supplied by Datametrics many years ago and is pretty close to the ICOM interface CT-17. The Scancat interface proved to be unreliable when used with the other programs. Therefore, I used the Datametrics interface for all tests.

The first phase of the scanning test used each of the programs to download the contents of the R7000

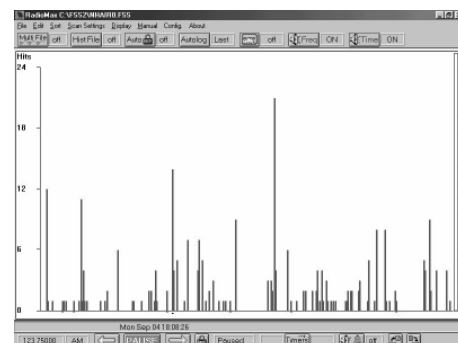


Figure 2 - RadioMax Pushing the R7000 to its Max

memory to the computer. Then each program was instructed to scan the same set of data. This allowed for a common speed test for all programs. Figure 1 is a comparison of the scan rate results.

Although I tried many times to have Scancat download the contents of the R7000 memory, the results were unpredictable. I tried both interfaces to no avail. So Scancat removed itself from the test. This is too bad, since Scancat has many useful control features.

Let's look at how the rest of these programs attempted to revitalize the R7000's painfully slow memory scan rate.

❖ Race Results

The unmodified R7000 has a memory scan rate of around seven channels per minute. My R7000, on which I have implemented a common speed modification, has a scan rate of about eleven channels per second. So what scan rates result from use of these software control programs?

The ScannerWear program, although adding a very useful group of functions, actually decreased the scan rate to between 4 and 8 channels per second. The first scan occurred at the lower scan rate of 4. Then the rate increased to 8 channels per second on subsequent scans.

ScanStar, always an excellent performer, resulted in a very respectable scan rate of 12 channels per second. The latest version of this program uses color to help the user in a very effective manner. ScanStar version 7.62, with its new screen layout and color, advanced scanning, logging and database features, added to its wide range of compatible receivers, makes it one of the best packages I've ever used.

❖ What is a RadioMax?!

The big surprise came from RadioMax. This program can control a whole range of ICOM, AOR, Kenwood, Uniden and other radios. This simple to use program scanned the memory chan-

R7000 SCAN RATE TESTS

PROGRAM	VERSION	SCAN RATE Channels/sec
ScanStar	7.62	12
ScannerWear	2.5	8
RadioMax	5.17	18
Scancat	7.5	See Text
R7000 Internal		X
Modified R7000		10

Figure 3 - R7000 Spectrum Result Using RadioMax

nels at a blazing (well, relatively) 18 plus channels per second. That's more than twice the speed of a stock R7000!

RadioMax has been designed with an exceptionally easy user interface. See Figure 2 which shows RadioMax scanning the downloaded memory frequencies.

It proved to be the simplest to operate, yet provided easy access to advanced features. RadioMax allows the user to set up a scan frequency range. As you run the search, a bar graph showing active frequencies is generated.

This can be further speeded-up if you save just the active frequencies. After you have left the program in the search mode for a long period you will have a good list of active channels. Scanning these discrete frequencies brings us back to the higher 18 channels per minute rate.

Of course, with RadioMax you can have the program announce the frequency of each "hit" and the time. This is very useful if you want to capture the loggings with a stereo tape recorder – one channel for the signal audio, the other for frequency and time information. RadioMax also give the user the opportunity to store received audio and announcements in a digital form in the computer's memory. But, be aware that this feature is a memory hog of the highest order.

❖ Max or Star?

RadioMax will allow you to, simply and easily, bring your ICOM R7000 scanning performance into the 21st century. Its many features included fast scanning and an excellent spectrum display, Figure 3. Although not real-time, it is one of the best I've used with the R7000. So, if you have an R7000, want a very simple-to-use, yet powerful control program, and want to speed up the snail, look no further than RadioMax. At \$45 it is an excellent value

On the other hand, if you have an R7000 and a main scanner receiver that was made after Reagan was President and you need advanced database functions, then check out the classic ScanStar. I don't think either will disappoint you.

Don't misinterpret the small amount of print given to ScannerWear. My editor is already trying to cut the column in half! ScannerWear has many useful features and functions and works with a number of scanners. Although we just touched on ScanCat this time, if you do radio monitoring, it is definitely worth a look.

❖ New Master = New Tricks

Initially, I was concerned that due to the R7000's circuits settling time, the higher scan speed that some of these programs could achieve would not be useful. In other words, although scanning at a high speed, signals would be missed or passed over. However, within reason (not setting timer parameters to zero), I have not found this to be the case with the R7000 using RadioMax or ScanStar.

RadioMax version 5.4, the lowest price of the four, is available for \$45 including shipping and handling from Future Scanning Systems at <http://www.futuresscanning.com>, or by telephone 918-335-3318. Check out ScanStar Deluxe at <http://www.scanstar.com>, or by phone at 1-408-926-5630. At \$159.97, with all of its database and trunk tracking features it's hard to beat for its wide breadth of uses. ScannerWear at \$59, is a product

of R.C.S.I., and can be found at <http://www.radioscans.com>. The venerable ScanCat can be found prowling at <http://www.scancat.com> for \$159.95 for the SE version.

We have seen that there is still a lot of high quality life left in the old R7000 if we allow it to be controlled by a new master, the PC. The result is not a 100 channels per second scanner. But the overall signal performance, features and new higher speeds makes it a very respectable scanner. Although the R7000 is one of the best designed receivers that can be rejuvenated by computer control, don't overlook less sophisticated, but still capable, receivers such as the Yaesu FRG-9600.

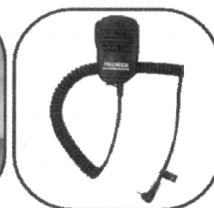
I guess as we prepare to celebrate the passing of another year, it is a bit comforting to know that older does not necessarily equate to useless. Wishing you all a Happy Holiday Season.

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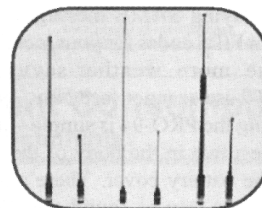
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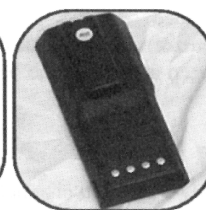
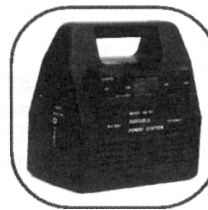
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What is receiver selectivity?

Selectivity is one of the major specifications of any receiver. While sensitivity is important to ensure that it can receive signals at a sufficient strength, selectivity is also very important. It is this parameter that determines whether the receiver is able to pick out the wanted signal from all the other ones around it. The quality of selectivity is sometimes expressed using the letter Q.

The filters used in receivers these days have very high levels of performance and enable receivers to select out individual signals even on today's crowded bands.

❖ Superhet principle

Most of the receivers that are used today are superheterodyne radios. In these sets the incoming signal is converted down to a fixed intermediate frequency (IF). It is within the IF stages that the main filters are to be found. It is the filter in the IF stages that defines the selectivity performance of the whole set, and as a result the receiver selectivity specification is virtually that of the filter itself.

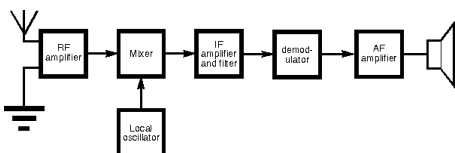


Figure 1 Block diagram of a basic superhet receiver

In some receivers, LC filters (simple inductor-capacitor circuits) may be used, although ceramic filters are better and are used more widely nowadays. For the highest performance, crystal or mechanical filters may be used, although they are naturally more costly and this means they are only found in high performance sets.

❖ Filter parameters

There are two main areas of interest for a filter, the pass band where it accepts signals and allows them through, and the stop band where it rejects them. In an ideal world, a filter would have a response something like that shown in

Figure 2. Here it can be seen that there is an immediate transition between the pass band and the stop band. Also in the pass band the filter does not introduce any loss and in the stop band no signal is allowed through.

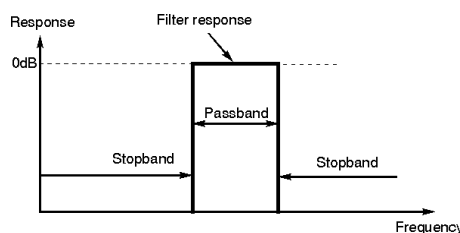


Figure 2 The response of an ideal filter

In reality it is not possible to make a filter with these characteristics and a more typical response is shown in Figure 3. It is fairly obvious from the diagram that there are a number of differences. The first is that there is some loss in the pass band. Secondly, the response does not fall away infinitely fast. Thirdly, the stop band attenuation is not infinite, even though it is very large. Finally, it will be noticed that there is some in-band ripple.

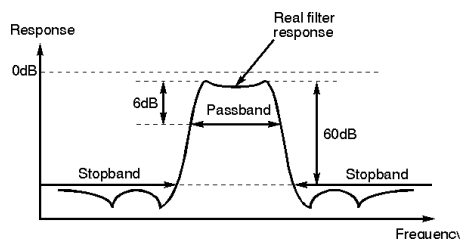


Figure 3 Typical response of a real filter

In most filters the attenuation in the pass band is relatively small. For a typical crystal filter, figures of 2 - 3 dB are fairly typical. However, it is found that very narrow band filters like those used for Morse reception may be higher than this. Fortunately it is quite easy to counteract this loss simply by adding a little extra amplification in the intermediate frequency stages and this factor is not quoted as part of the receiver specification.

It can be seen that the filter response does

not fall away infinitely fast, and it is necessary to define the points between which the pass band lies. For receivers the pass band is taken to be the bandwidth between the points where the response has fallen by 6 dB, i.e. where it is 6 dB down or -6 dB.

A stop band is also defined. For most receiver filters this is taken to start at the point where the response has fallen by 60 dB, although the specification for the filter should be checked for this as some filters may not be as good. Sometimes a filter may have the stop band defined for a 50 dB attenuation rather than 60 dB.

❖ Shape factor

It can be seen that it is very important for the filter to achieve its final level of rejection as quickly as possible once outside the pass band. In other words, the response should fall as quickly as possible. To put a measure on this, a figure known as the shape factor is used. This is simply a ratio of the bandwidths of the pass band and the stop band. Thus a filter with a pass band of 3 kHz at -6dB and a figure of 6 kHz at -60 dB for the stop band would have a shape factor of 2:1.

For this figure to have real meaning the two attenuation figures should also be quoted. As a result the full shape factor specification should be 2:1 at 6/60 dB.

❖ Filter types

A variety of types of filter may be used in a receiver. Older broadcast sets use LC types, i.e. ones containing only inductors and capacitors. These are normally in the form of a transformer that is used to couple one stage of the receiver to the next. Most sets have two or three of these transformers each of which has an adjustable ferrite core to fine-tune its resonant frequency. Sets using these IF transformers need to be aligned during manufacture to ensure that all the transformers are tuned to the correct frequency. Also after long periods of use, sets can be realigned to ensure the optimum performance is maintained.

In today's sets, ceramic filters are more widely used. Their operation hinges around a phenomenon known as the piezo-electric effect that is exhibited by some materials, in this case a special form of ceramic. Here an electrical signal across the ceramic will set up mechanical vibrations. Similarly any mechanical vibrations on the ceramic will result in an electrical signal being generated. By using this effect an electrical signal is linked to the mechanical resonances of the material. As these resonances can be very sharp, it gives a filter with a very high Q or degree of selectivity.

Ceramic filters can be very cheap, some costing only a few cents. However, higher performance ones are also available, and these are likely to be found in scanners and many other receivers.

For really high levels of filter performance crystal filters are used. Crystals are made from quartz, a naturally occurring form of silicon, although today's components are made from synthetically grown quartz. These crystals also use the piezoelectric effect and operate in the same way as ceramic filters but they exhibit much higher levels of Q and offer far superior degrees of selectivity. Being a resonant element they are used in many areas where an LC resonant circuit might be found. They are used in oscillators (many computers have crystal oscillators in them), but they are also widely used in high performance filters.

Normally, crystal filters are made from a number of individual crystals. The most commonly used configuration is called the half lattice filter as shown in Figure 4. Further sections can be added to the filter to improve the performance. Often a filter will be quoted as having a certain number of poles. There is one pole per crystal, so a six pole crystal filter would contain six crystals, and so forth. Many filters used in amateur communications receivers will contain either six or eight poles.

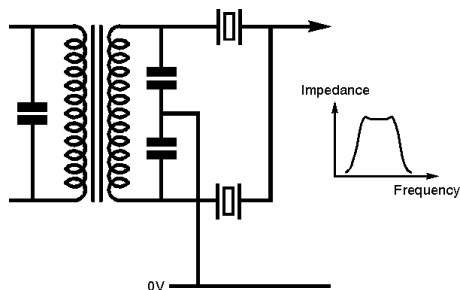


Figure 4 A basic half lattice crystal filter section

❖ Choosing the right bandwidth

It is important to choose the correct bandwidth for a given type of signal. It is obviously necessary to ensure that it is not too wide, otherwise unwanted off-channel signals

will be able to pass through the filter. Conversely, if the filter is too narrow then some of the wanted signal will be rejected and distortion will occur. As different types of transmission occupy different amounts of spectrum bandwidth it is necessary to tailor the filter bandwidth to the type of transmission being received. As a result many receivers switch in different filters for different types of transmission. This may be done either automatically as part of a mode switch, or using a separate filter switch.

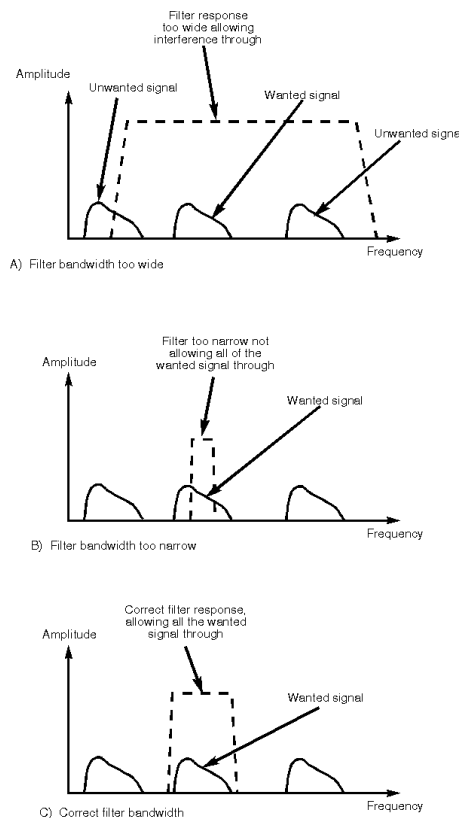


Figure 5 Using the correct filter bandwidth

Typically a filter for AM reception on the shortwave bands will have a bandwidth of around 6 kHz, and one for SSB will be approximately 2.5 kHz. For Morse reception 500 and 250 Hz filters are often used.

❖ Summary

Selectivity is particularly important on today's crowded bands, and it is necessary to ensure that any receiver is able to select the wanted signal as well as it can. Obviously when signals occupy the same frequency there is little that can be done, but by having a good filter it is possible to ensure that you have the best chance of receiving and being able to copy the signal you want.

More information about radio, ham radio, and electronics can be found at <http://www.radio-electronics.com>

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Alinco DJ-X2T Portable Wide Band Receiver

We've tested three tiny portable scanners in about as many years: the ICOM IC-R2 (April 1999), the AOR AR-16 (August 1999), and the Yaesu VR-500 (February 2000). A simple pair of AA batteries can power all three models. AOR USA is no longer selling the AR-16, which lacks a limit search and adjustable squelch. The other two remain popular and their discount prices have dropped making them even more attractive.



Figure 1. Alinco DJ-X2T wide coverage receiver

The DJ-X2T tunes AM, FM, and WFM signals from 0.53 to almost 1000 MHz. The IC-R2 and VR-500 top limits are 1310 and 1300 MHz respectively.

❖ Dual Battery System

The DJ-X2T contains an internal lithium-ion battery. If you don't mind the added size, the radio can be powered instead from three AA cells by snapping an auxiliary battery case/charger onto the rear (fig. 3). The combination of radio and battery case is as thick as an IC-R2 and VR-500.

The charger is used in tandem with an AC wall

wart to charge the internal lithium-ion battery at a fast 2-hour rate. Both the battery case/charger and the wall wart are included with the DJ-X2T. The IC-R2 is furnished with a 7-hour wall charger and two NiCd batteries, while the VR-500 comes with neither.

When powered by the three AA batteries, our DJ-X2T consumes 94 mA while scanning. That's less than the IC-R2 (109 mA) and more than the VR-500 (73 mA), which are powered by two AA batteries.

❖ Construction

The slim profile and silver coloring are reminiscent of an art deco cigarette holder from the 1930s. While the case is plastic, the rear panel is made of metal.

Producing a scanner as thin as the DJ-X2T is bound to involve compromises. The radio is truly a shirt pocket model and is too thin to stand upright without the external battery holder attached. There is no belt clip so you must purchase a holster unless you carry the DJ-X2T in a pocket.

The DJ-X2T has no knobs. Operations are performed using an 8 key, nonnumeric pad and a side mounted rocker switch. The keypad is a plastic membrane and the keys are slightly raised "bubbles." Pressing them feels like pressing on burnt toast. One must take care to avoid puncturing a membrane keypad with a sharp fingernail. The key press confirmation beep tone is low volume. It may be disabled but the keys have almost no tactile feedback so we recommend you keep the beep.

Volume and squelch adjustments require multiple key presses using two keys. Changing the frequency takes work too. You can press the 1 MHz or 10 MHz key while pressing the side mounted up/down rocker switch for large frequency excursions.

The supplied flexible antenna screws onto

a brass SMA connector. If you want to listen without attracting unwanted attention, a clever innovation permits you to disconnect the flexible antenna and employ the earphone cord as an antenna. In actual use, signals are much stronger when using the flexible antenna.

❖ VFO and Memory

The DJ-X2T has 700 memory channels, divided into 10 banks of 70 channels. With 700 channels, the DJ-X2T is positioned midway between the IC-R2's 400 channels in 8 banks and the VR-500's 1000 channels in 10 banks. All three models provide a single VFO.



Figure 3. Rear view of DX-X2T (left) and the snap on, auxiliary battery pack/charger (right).

The DJ-X2T can scan memory, search using the VFO or perform a limit search using one of 20 programmable ranges. A maximum of 5 memory banks may be linked together for scanning. The IC-R2 scans only one bank at a time and the VR-500 scans any combination of its 10 banks. All three models let you choose to resume scanning after a fixed interval or sometime after the signal ends. The DJ-X2 and VR-500 rescan delay time is 2 seconds. The IC-R2 provides a choice of rescan delay times.

All three models permit memory channels to be locked out from the scan and frequencies to be skipped during a limit or VFO search.

❖ Other Features

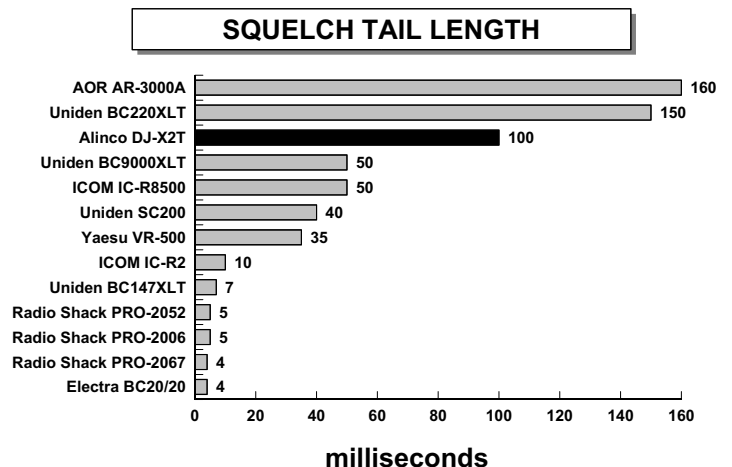
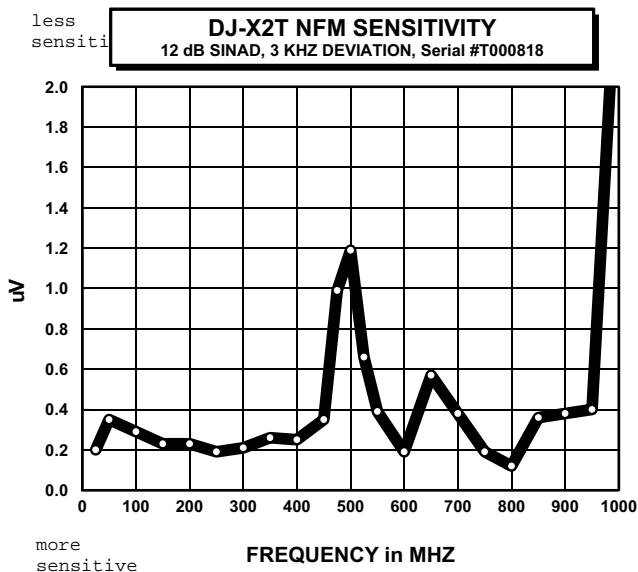
An attenuator may be enabled and is global to all channels. An "Easy Mode" limits commands and prevents memory programming.

You can select from among factory preprogrammed AM, FM, and TV broadcast frequencies in Preset Mode, but the frequencies don't align with American allocations! The AM broadcast band, for instance, is set up to tune in 9 kHz steps from 531 to 1620 kHz and the TV channels are wrong. Wake up, Alinco!

One DJ-X2T may be cloned to another if you buy or build the proper cable and connect the two radios via the earphone jack. Users will be able to program the DJ-X2T using a personal computer, the proper cable (not supplied), and software avail-



Figure 2. Alinco DJ-X2T, Yaesu VR-500, and ICOM IC-R2.



Notes:
One sample of each model tested.
Produced by a 155 MHz, 1uV unmodulated signal.
Squelch control set beyond threshold in NFM mode.
Copyright 2000, Bob Parnass, A

able from the Alinco web site, <http://www.alinco.com>. RT Systems is planning to sell programming software, as well. Contact RT Systems at (256) 880-3093 or visit their web page at <http://www.rtsars.com> for price and availability.

Advertisements for the DJ-X2T brag about a "bugging detector" feature. When placed in the bugging detector mode, the DJ-X2T looks for a

Measurements

Alinco DJ-X2T Wideband Receiver

S/N T000818

Street price \$269.95

Alinco, Inc.
438 Amapola Ave., Unit 130
Torrance, CA 90501

Frequency coverage (MHz):
0.530 - 999.995 (USA version, cell bands blocked)

Step sizes (kHz):
5, 6.25, 8.33, 10, 12.5, 15, 20, 25, 30, 50, 100

FM modulation acceptance: 10.5 kHz

Intermediate Frequencies:
248.45, 38.85 (AM, NFM), and 0.45 MHz

Image rejection due to 1st IF:

47 dB at 40 MHz
67 dB at 155 MHz
74 dB at 460 MHz
64 dB at 860 MHz

Audio output power, measured at ext. speaker jack:
31 mW @ 10% distortion

Squelch tail length (1uV @155 MHz): 100 ms.

Practical memory scan speed: 11 channels/sec.

Current consumption @ 4.5 VDC

off: 0 mA
scanning: 94 mA
full volume: 124 mA

signal with "howling" feedback while scanning the memory channels you've programmed in advance. The howling is presumed to be feedback from an eavesdropping transmitter nearby.

Performance

We borrowed two DJ-X2T scanners for testing. The first one (s/n T000521) receives all FM signals accompanied by a high noise level and further testing shows the radio to be defective. The replacement DJ-X2T (s/n T000818) performs better.

Audio from the thumb-tip-sized speaker is sufficient for listening in a quiet room, but far too weak for use in a noisy room or outdoors. DJ-X2T volume may be set at one of 20 discrete levels and we had to set it at levels 17 and 18 in a quiet room.

Our IC-R2 easily has the best audio of the three scanners, with the VR-500 in between. Both have larger speakers than the DJ-X2T. It's best to use the DJ-X2T with an earphone. The supplied earbud is padded, fitted with a subminiature (3/16") plug, and reproduces sufficient, pleasant audio.

A squelch tail is the noise burst ("kerchunk" sound) heard at the end of a transmission. We measured our DJ-X2T's squelch tail at 100 ms. The accompanying chart shows our VR-500's tail at 35 ms and our IC-R2 has a brief 10 ms tail.

Our DJ-X2T is remarkably sensitive except

for a deaf spot near 500 MHz. The 145 - 160 MHz band is peppered with intermod products from pagers and a 162.4 MHz NOAA weather transmitter while using an outdoor antenna. Our VR-500 and IC-R2 are much cleaner under the same conditions, with the IC-R2 having the least intermod of the three scanners.

Bottom Line

The DJ-X2T is at its best when used in discreet situations. While powered by the internal battery, the DJ-X2T's ultra slim profile and ability to use the earphone for listening let you monitor virtually unnoticed. Drawbacks include low speaker audio, long squelch tail, and the membrane keypad.

We prefer the VR-500 and IC-R2 for most listening situations. When listening on the internal speaker, the thicker IC-R2 and VR-500 provide much better audio and are easier to use. They are still small enough to carry comfortably in a shirt or jacket pocket.

See the Grove ad on page 25

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REVIEW

Protek 3201 RF Field Analyzer

By Bob Grove

Three or four years ago, we reviewed a radical new test instrument produced in Korea, the Protek model 3200. Now upgraded to a model 3201, we thought it might be time to take another look at this unusual piece of equipment.

The 3201 is ideally suited for the installation and maintenance of paging, two-way radio, cellular telephone, cable TV, and satellite TV systems as well as antenna site maintenance.

Lightweight (1.4 lbs.) and compact (4-1/4"W x 9"H x 2"D), the 3201 is intended as a hand-held, portable, multi-function, field test instrument for the radio industry. As such, it is essentially a combination spectrum analyzer, frequency counter, and data recorder with considerable flexibility, and it is extremely easy to use by simply following its on-screen menu.

With a frequency coverage of 100 kHz-2060 MHz, direct-entry keypad, and a versatile LCD display, the unit is designed to operate as a stand-alone instrument or to interface with a computer and a printer. Software, documentation, and an RS232C cable are provided.

The Display

The backlit LCD measures 2-1/2" square (3-1/2" diagonally), and contrast is continuously adjustable for any lighting condition.

Spectrum Analysis

The spectrum analyzer mode is quite user friendly, allowing a choice of sampling steps between 5 kHz and 6 MHz, with 160 total samples per sweep. This equates to spans as small as 800 kHz, to as great as 960 MHz. Unfortunately, the user cannot select resolution bandwidth.

Sweep speed is quite slow, taking about 13 seconds per span, making the capture of short-term transmissions rather hit-and-miss. It is most satisfactory for continuous carriers.

An operating mode may be chosen which allows simultaneous sweep and audio recovery, affording the user the opportunity to sample the hits as the sweep progresses across the spectrum.

Automatic scanning/sweeping is user-programmable, allowing continuous spectrum sweeping, recurrent sweeping over a range, or scanning discrete memory channels. Scanning speed is 12.5 channels per second.

A rotary tuning knob is provided, but its rubbery, erratic response mandates the use of an alternative set of up/down keys.

Audio Recovery

The 3201 does have the capability of allowing audio recovery of AM, WFM, and NFM signals; while SSB is also specified, the low injection level and apparent lack of AGC makes such signals virtually unintelligible. A tiny, one-inch speaker slot on the rear of the unit is barely adequate for quiet environments.

An external earphone jack is provided (ear bud included).

Although sensitivity is excellent (typically 0.5 microvolts NFM), poor dynamic range prohibits serious monitoring applications. Using the rubber duckie antenna included with the set, it works reasonably well, but connecting a large, outdoor antenna invites overload and the attendant mish-mash of mixed signals.

An adjustable squelch level is visualized by an attendant bar graph, allowing the user to adjust audio cutoff levels, as well as choose signal thresholds to automatically stop scanning and searching sequences.

Additional sources of noise include a variety of self-generated spurious signals ("spurs") from the instrument itself. Motorboating sounds, whines, and hisses were commonly heard at various frequency settings; bringing your hand near the LCD while monitoring AM at lower frequencies invites a loud wailing from the display's driver circuitry.

However, audio monitoring is not the instrument's purpose; it is designed for near field measurement of discrete signals, not for scanning the spectrum for listening purposes.

Up to 1600 memory channels including fre-

quency, amplitude, and channel identifier, may be stored in 10 banks.

Frequency Counter

Seven-digit readout with +/-50 PPM accuracy may be expected from 9-2060 MHz. Sensitivity averages 100-150 millivolts, and acquisition time is a short 0.5 seconds. Up to 10 of these readings may be stored in memory for later recall.

Bar Graphs

For data comparison, the user may select a display of 1, 5, 10, 20, 40, 80, or 160 separate bar graphs. Two separate signal levels (such as video/sound) may be compared on screen in the comparison mode, or up to 160 different signal levels may be shown.

A printer driver allows a permanent record to be made of the instrument's measurements over time.

Power

The 3201 is powered by six internal AA NiCd cells; optionally, an external source of 12 VDC may be applied for extended periods of portable or mobile use. Battery operation is rather short, only about one-half hour with the NiCds supplied with the unit. Recharge time, though, is short—about 1-1/2 hours. A wall adaptor is provided.

To conserve power, the audio section may be switched off during measurements-only use, and the instrument may be programmed to automatically shut down after 5, 10, 20, or 30 minutes of idle time.

The Bottom Line

We found the Protek 3201 to be a highly versatile piece of test equipment, suitable for a variety of field instrumentation applications where compactness and flexibility are of paramount importance.

The 3201 comes with carrying strap, canvas zipper bag, BNC/BNC coax jumper, flex whip, rechargeable NiCd cells, AC wall adaptor/charger, ear bud, PC software, computer cable, documentation, and operating manual.

The Protek3201 is \$2100 retail from Protek, 154 Veterans Drive, Northvale, NJ 07647. Phone(888) 784-8400, fax (201) 767-7343, email hcprotek@hcprotek.com, or visit their web site at <http://www.hcprotek.com>



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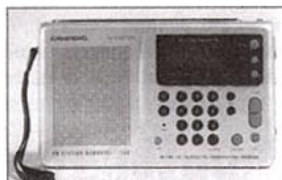
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PCR100



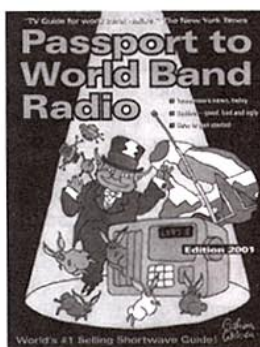
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WHAT'S NEW?

TELL THEM YOU SAW IT IN MONITORING TIMES

Yaesu Wide Coverage Receiver

The new multimode desktop scanning receiver from Yaesu still had no anticipated release date at presstime, but advance details have been emerging to get hobbyists drooling. Featuring continuous frequency coverage (less cellular) from 100 kHz to 2.6 GHz and direct keypad frequency entry, the VR-5000

the VR-5000 is a lot of radio in a small package at an anticipated price of \$899.95. It comes with an adapter provided. Optional accessories are a digital signal processing unit, which provides noise reduction, bandpass filtering, notch filtering, and CW (narrow) peak filtering; digital voice recording unit; and a voice synthesizer, which provides audible announcements of the operating frequency for those with vision impairment.



sports a wide variety of scanning capability. The VR-5000 will receive all modes: CW, LSB/USB/AM/AM-N/AM-W/FM-N/FM-W.

Up to 2000 memory channels may be stored in as many as 100 memory banks; both the memory banks and memory channels may be given alpha-numeric labels, and they may be sorted by frequency, alpha-numeric channel name, or by operating mode.

To aid in shortwave listening, a pre-loaded bank of the most popular shortwave broadcast stations is also provided. The frequency list may be edited by the user to accommodate changes. A built-in World Clock includes a time zone map for keeping track of world broadcast times.

Among the advanced features of the VR-5000 are dual receive, a 100 kHz-10 MHz span band scope graphical activity monitor, a front-end RF tune "preselector" (1.8-1000 MHz), field strength meter, audio waveform meter, and Yaesu's exclusive "Smart Search" automatic memory loading feature. Additional features include graphical memory display, memory overwrite protection, memory offset tuning, channel skip, memory sort, frequency-programmable timer/alarm, selectable automatic programming of tuning steps and mode for your frequency range, and more!

Measuring only 7.1x2.75x8 inches and weighing a mere 4.2 lbs,

For pricing and availability call Grove Enterprises (800-438-8155 or visit <http://www.grove-ent.com>) or contact your favorite Yaesu dealer. Watch for a full review in *MT* when the product is released.

QRP Kit

Got an amateur radio hobbyist looking for a winter project? Here's a new 15 meter CW transceiver kit from Oak Hills Research – Doug Demaw's former company, now owned by Milestone Technologies. The \$129.95 OHR 100A kit is available for 15, 20, 30, and 40 meter bands. The 15 meter version puts out a solid 4 to 4.5 watts of RF and can be aligned for either the general or novice portions of the band. Marshall Emm, N1FN, says that OHR has done everything to make this an easy kit to build and an excellent radio to operate.



The radio features adjustable front panel output control; LO available via rear-panel jack for use with external frequency counter or digital dial; variable receiver offset tuning; four pole crystal IF filter

with adjustable IF bandwidth 1200Hz to 400Hz; and adjustable pitch and volume.

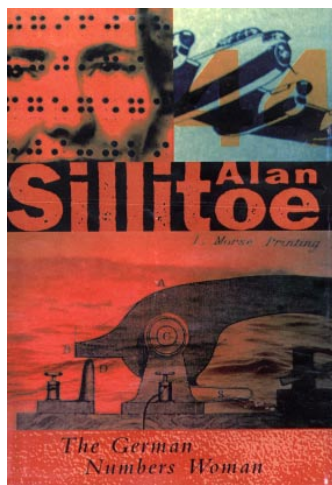
For more information and to order, contact Milestone Technologies at 24600 South Moline Way, Aurora, CO 80014-1833; (303) 752-3382 or 800-238-8205; or visit <http://www.MorseX.com>

German Numbers Woman

By Alan Sillitoe

Few contemporary novels concern any aspect of amateur radio broadcasting, so when one appears it seems worthwhile to bring it to the attention of the ham/SWL community.

The theme of Sillitoe's most famous work, *The Loneliness of the Long Distance Runner*, was people's isolation and how they cope with it. Since ham radio and shortwave listening are often seen as sedentary and solitary pursuits, Sillitoe may have returned to that theme in his new novel, *The German Numbers Woman*.



Howard, the main character, is a 60-year-old blind RAF veteran and radio amateur operator who spends long hours monitoring ship to shore communications. One night he hears a woman reading German numbers. Even though he seems to be happily married, Howard becomes obsessed with this female voice. He creates a fantasy world around the German numbers woman and, finally, he steps into it. Many twists and turns result in a suspenseful tale of ro-

mance and drug smuggling on the high seas which is bound to entertain those interested in the adventure of shortwave communications.

The German Numbers Woman, ISBN 0006552013, is published by Trafalgar Square and can be found at book stores and from Amazon.com on sale at \$11.25.

— Reviewed by Martin Gallas

NRC AM Radio Log/Station Map

Radio hobbyists who prowl the AM broadcast bands (530-1700 kHz) require up-to-date station information in order to maximize their time at the radio. For years now the National Radio Club (NRC) has led the way with top-notch publications DXers should not be without.

A couple of decades ago publications such as *White's Radio Log*, with complete listings of all AM radio stations on-the-air, were common on magazine racks. But this publication and others are no longer available. So where do you get up-to-date information without spending a small fortune?

You should consider purchasing the twenty-first edition of the venerable National Radio Club *AM Radio Log*. The NRC *Log* contains complete AM broadcast band radio listings from the United States and Canada, including valuable last minute information on new broadcasters in the expanded AM band (1610-1700 kHz).

In the main section of the *AM Radio Log*, station listings are broken down by frequency. Each AM broadcast listing includes the station call letters, location, time zone, antenna pattern codes, day and night transmitter powers, special sunrise/sunset power authorizations, station address/telephone number, programming formats, network affiliation(s), broadcast schedule (if known), and station slogan. There are also cross-references by city and by call letters. The NRC *AM Log* is packaged as 320 loose leaf pages (8-1/2" x 11" size) punched for insertion in a three ring binder.

Members of the NRC, DX Audio Service, or International Radio Club of America (IRCA) may purchase the *AM Radio Log* for \$16.95. Non-member prices for the *AM*

Radio Log are as follows: U.S. & Canada US\$22.95, Latin America US\$24.00, Europe US\$25.00, and all others US\$28.00.

A companion publication to the *NRC Log*, the new sixth edition *NRC Station Location Map Book* by Bill Hale, has also been released. Like the *NRC Logbook*, this edition of the *NRC Station Map Book* is 8-1/2" x 11" in size, 3-hole punched, loose leaf format and has 239 pages. There are listings for both United States and Canadian AM broadcast stations, but low power repeater stations in Canada and Alaska have been omitted.

The book contains maps with index numbers corresponding to the station's geographical location. The latitude and longitude of each transmitter site are also listed. There are nine pages of detailed instructions on how to calculate both distance/bearing using the latitude and longitude information in this book, and sunrise/sunset formulas by Dave Sundius. The data in this book is current through November 1, 2000.

Prices for the *NRC Station Location Map Book* are as follows: U.S. & Canada US\$17.95, Latin America US\$21.50, Europe US\$23.50, and all others US\$25.00.

Send all orders for both publications to: National Radio Club, Publications Center, Box 164, Dept W, Mannsville, NY 13661-0164 USA.

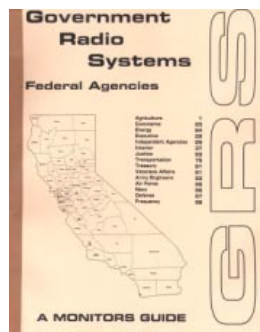
AM broadcast DXers and listeners will find both of these products extremely valuable in tuning distant stations in the North American AM broadcast bands.

— Reviewed by Larry Van Horn

Government Radio Systems

by Robert Kelty

Although concentrating on the State of California, this new monitor's guide has nationwide utility because of the common frequency database shared by federal government agencies across the country.



Agencies listed include Agriculture, Commerce, Energy, Executive, Interior, Justice, Transportation, Treasury, VA,

Army Engineers, and military. Typical listings detail location, channelization plan, squelch tones, and repeater input/output pairing.

No matter where you live, if you are looking for more insight into the 162-174/406-512 MHz bands, Kelty's *GRS* will help.

To order, send check for \$18 to Mobile Radio Resources, 1224 Madrona Ave., San Jose, CA 95125. Word Perfect disk is available for \$25.

— Reviewed by Bob Grove

Free Online Database

You are invited to visit <http://www.shoc.ch> to experience the online shortwave database from the makers of RadioSpectrumManager software. The site claims, "We do not only sell software, we give you also the best database to run it." The database consists of 127,000 records compiled from on-air monitoring and includes both broadcast and utility loggings. Although the monitoring is done primarily from Europe, it offers an interesting perspective on listening targets that may not be audible in the U.S.

Contact Radio-Active!shoc Inc., R.Haenggi, The Radiomonitoring Company, CH-8499 Sternenberg, Switzerland +41-52-3941255; <http://www.shoc.ch>

News and Rumors

o MacRADiO - WiNRADiO for Mac is coming soon. This will be the first time a wide-band PC radio is available for Mac. This will be based on the WR-1550e receiver.

o Drake has ceased the production of the SW8. It has become the victim of sagging sales and increasing costs. The R8B is still a viable product and there are no plans to discontinue that model.

o AOR has discontinued the AR16 pocket scanner. While a nice little unit, it was never able to profitably compete.

o The AR8600 wide coverage desktop/mobile receiver (500 kHz-2040 MHz less cellular) from AOR still had no price or availability information at presstime. It will feature all mode detection, 1000 memory channels in 20 banks, and will interface with your PC.

o What do the A and B mean on the back of Radio Shack's updated PRO 92 models? Radio Shack's main tech support says the letter is the designator of the location of the manufacturer, "A" being Japan, "B" being China.

o The Icom R3 has been FCC type accepted and is selling for \$499.95

o The BC 780XLT has been type accepted and is expected to be available this month for \$369.95.

Books and equipment for announcement or review should be sent to "What's New?" c/o Monitoring Times, P.O. Box 98, 7540 Highway 64 West, Brasstown, NC 28902. Press releases may be faxed to 828-837-2216 or emailed to mteditor@grove-ent.com.




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- Charles (Chuck) Boehnke
Keaau, Hawaii

"You and the MT staff that put this project together have done a FANTASTIC job. You would seem to be the leaders in the field presenting material in this manner so it can be archived so easily. This is the way to receive a magazine."

- Don Nauer

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INDEX OF ADVERTISERS

Alinco	9
Antique Radio Classified	91
AOR	Cover III
Austin Antenna	21
Bandercom	31
Bruce & Associates	13
Communications Electronics	15
Computer Aided Technologies	7
Computer International	11
Davis Instruments	93
Fineware	69
Grove Enterprises	21,25,37,47, 87,95
Grundig	Center Section
ICOM	Cover IV
Jacques d'Avignon	61
John Figliozi	75, 99
Kevin Carey	79
KIWA Electronics	87
Klingenfuss	89
Monitoring Times	106
OptoElectronics	Cover II
Passport to World Band Radio	3
Popular Communications	37
Premier Communications	97
Radiomap	71
Radioworld Inc.	89
RC Distributing	73
Scanner Master	35
Skyvision	73
Small Ear	79
Small Planet Systems	71
Swagur Enterprises	105
Tigertronics	79
Universal Electronics	71
Universal Radio	103
Viking	101
W5YI	35
WiNRADiO	1

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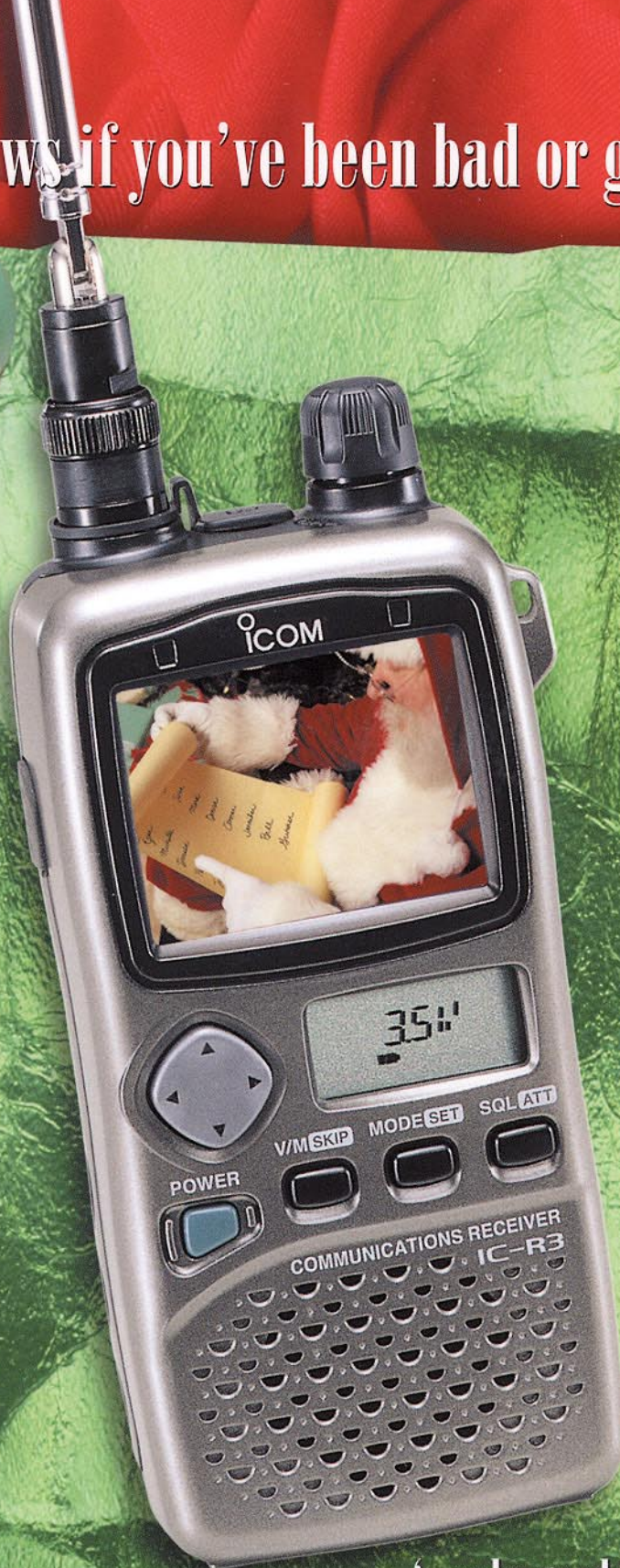
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